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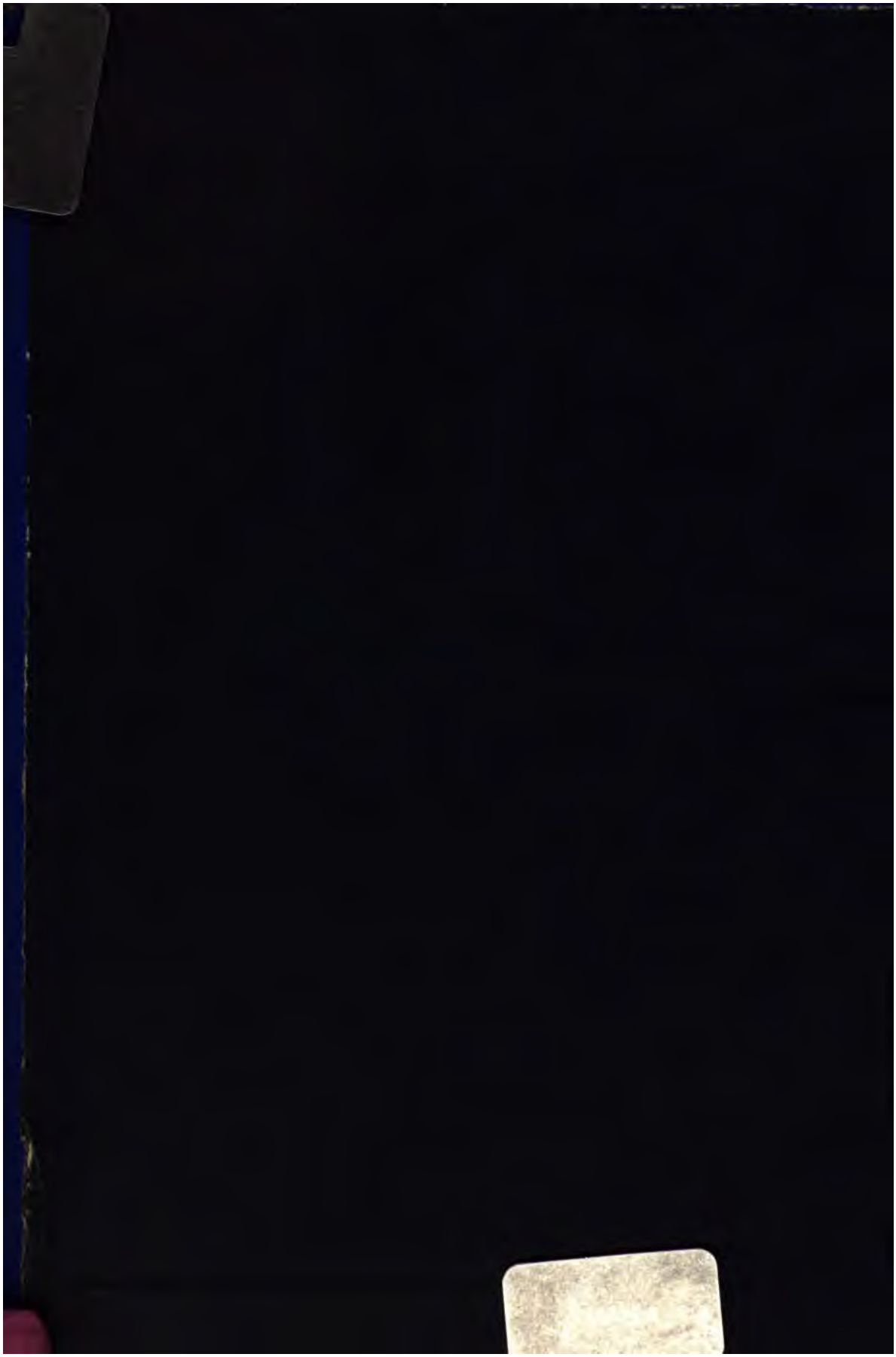
THE SEA

BY

JULES MICHELET



THE SEA.

AFTER A STORM

THE SEA

JULES MICHELET

T. NELSON & SONS

THE SEA.

BY

JULES MICHELET.

" The weltering flood
Of the huge sea, whose tumbling hills, as they
Turn restless sides about, are black or gray,
Or green, or glittering with a golden flame."

WILLIAM MORRIS, *The Earthly Paradise.*

LONDON:
T. NELSON AND SONS, PATERNOSTER ROW;
EDINBURGH; AND NEW YORK.

1875.

198. h. 32

PREFACE.

IT is with sincere pleasure I find myself entrusted with the task of introducing to the English public another of those admirable treatises on zoological and physical subjects which marked a distinct era in M. Michelet's literary life. These treatises are four in number, and were originally published in the following order:—*L'Oiseau* ("The Bird"), 1856; *L'Insecte* ("The Insect"), 1857; *La Mer* ("The Sea"), 1861; and *La Montagne* ("The Mountain"), 1868. I have spoken of them as "treatises on zoological and physical subjects;" but, in truth, they are something less and something more. They do not deal with these subjects as the man of science does; they are wanting in systematic arrangement and definiteness of detail. But, on the other hand, they exhibit a quickness of insight, a richness of fancy, and a felicity of description for which the reader would look in vain to the manuals of zoologist or physicist. They open up to the student the inner meanings of Nature; they teach him that around and about us there is much which no philosopher can explain, which it is the province of the poet, or the ardent lover of Nature, to develop and illustrate. And this development, this illustration, is worked out by Michelet with all the force of a mature intellect,

and all the characteristic vigour of a picturesque and individual style. So that when the great writer occasionally "ventilates" sentiments not in entire accordance with our sober English taste, we are nevertheless charmed by the happiness of the diction in which they are clothed. And on almost every page some touch of tender feeling, some vivid gleam of imagination, some indication of profound sympathy, proves to the reader that he is under the spell of a powerful and original genius.

The publishers of the present volume have already produced an English translation of *L'Oiseau*—"The Bird"—which has passed through several large editions, and has been fortunate enough, *as* a translation, to win the approval of the critics, and the warm commendation of M. Michelet himself. I venture to hope that "The Sea" will meet with an equally cordial welcome.

It has been executed on the same principle; namely, that of rendering the original with the utmost fidelity, and of presenting even its piquancies of phraseology and audacities of idiom so far as was possible without offence to an English reader. It would have been easy to have adopted a more commonplace style, but then, such a style would not be Michelet!

W. H. DAVENPORT ADAMS.

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BOOK I.

A SURVEY OF THE SEA.

Again, God said, " Let there be firmament
Amid the waters, and let it divide
The waters from the waters.".....
So he the world
Built on circumfluous waters calm, in wide
Crystalline ocean.

MILTON.

BOOK I.

A SURVEY OF THE SEA.

CHAPTER I.

ASPECTS OF THE SEA FROM THE SHORE.

A GALLANT mariner of Holland, a cold and calm observer, who passes all his life upon the Sea, frankly admits that the first impression he derived from it was one of terror. Water, for every terrestrial being, every creature that breathes, is the non-respirable element—the element of asphyxia. A fatal and an eternal barrier, it irremediably separates the two worlds. Let us not be astonished if that enormous mass which we call the Sea, darkling and unfathomed in its profound depths, should always appear formidable to the human imagination.

The Orientals see in it only a gulf of bitterness—the *abyssmal night.* In all ancient languages, from India to Ireland, its synonym or analogue is "the night" and "the desert."

Ah, how sad it is to witness every evening the sun—that joy of the world and father of all life—going down into the darkness of its waves! It is the Earth's every-day sorrow,

and, especially, that of the West. Each day we look in vain upon this spectacle, and acknowledge the same powerful influence, the same effect of melancholy.

Plunge into the Sea to a certain depth, and we soon lose all perception of light; we pass into a dusky glimmer of one sole colour, a sinister red, and then this too disappears, and total darkness prevails. It is absolute obscurity, save, perhaps, some occasional flashes of a terrifying phosphoric splendour. The mass, immense in extent, enormous in depth, which covers the greater portion of our planet, seems a world of shadows. And it was this which so impressed, so overawed the pioneers of our race. They supposed that life ceased whenever light failed, and that, with the exception of its upper strata, the whole unfathomable profundity, and the bottom—if the abyss has a bottom—was one black solitude; nothing but pebbles and barren sand, save some bones and relics of humanity—the lost treasures which the greedy element ever seizes and never returns, jealously concealing in its remote recesses.

Nor does the water of Ocean reassure us by its transparency. It is not the attractive lymph of springs and crystal fountains. It is opaque and dull; it weighs heavily. He who risks himself within it, feels that it lifts him up. Thus it assists, we confess, the bold swimmer, but it also masters him; he feels like a feeble child, supported by a powerful hand which can as easily shatter him to atoms.

When once the ship breaks loose, who knows whither a sudden wind, an irresistible current, may carry it? It was in this wise that our Northern fishermen, in spite of themselves, discovered the America of the Pole, and brought back to Western Europe their dread of funereal Greenland. Every nation has its stories, its legends of the Sea. Homer, and the "Arabian Nights," have preserved for us many of these terrible traditions,—of reefs and tempests—of calms not less

murderous, where, in the midst of the waters, man dies athirst —of men-eaters, monsters, leviathan, the kraken, and the great sea-serpent. The name which has been given to the sandy desert, "Region of Fear," might well have been bestowed on the great maritime desert. The boldest navigators, the Phœnicians, the Carthaginians, and the conquering Arabs who would fain have swallowed up the globe, inspired by dreams of a golden land and the Islands of the Blest, ventured beyond the confines of the Mediterranean, launched themselves upon the vast Ocean, but soon paused in their enterprise. They were daunted by the sombre line, eternally heavy with clouds, which encountered them before they reached the Equator. They halt. They exclaim, "It is the Sea of Shadows!" And they retrace their homeward course.

It would have been impious, they say, to violate that sanctuary. Woe to him who shall yield to a sacrilegious curiosity! For in the last isle we touched at, we beheld a colossal and threatening figure which said,—"Go ye no further!"

These somewhat childish terrors of the ancient world exactly resemble the emotions of the novice in our own days —of the simple rustic who, coming from an inland country, suddenly beholds the Sea. It may, indeed, be said that every person, whose first glimpse of it is a surprise, feels the same impression. And animals, too, are visibly troubled by it. Even at ebb-tide, when, placid and weary, the wave crawls softly on the sand, the horse does not recover his courage; he trembles, and frequently refuses to pass the languishing ripple. The dog barks and recoils, and, according to his manner, insults the billows which he fears. He never makes peace with the doubtful element which he looks upon as no friend to him. We are told by a traveller that the dogs of Kamtschatka, though accustomed to the spectacle, are not the less terrified and irritated by it. In numerous troops they howl

through the protracted night against the howling waves, and endeavour to outvie in fury the Ocean of the North.

The natural introduction to the Ocean, its vestibule, which fitly prepares us for comprehending it, is the melancholy course of our north-western rivers, the vast sands of the South, or the landes of Brittany.

Whoever visits the Sea by either of these routes is powerfully impressed with the intermediary region which indicates its neighbourhood. The entire course of the rivers I speak of* is an undefined tract of reeds, osiers, and various plants, which, as the waters mingle and grow more and more brackish, gradually become marine. In the Landes, before we reach the Sea itself, you traverse a preliminary sea of coarse and stunted herbs, brake, and heather. When still a league or two distant from the shore, you note the dwarfed trees, bent and wretched, which, after their own fashion, announce by their attitudes—I had almost said by their strange gestures—the proximity of the mighty tyrant, and the cruel oppression of his breath. Were they not fettered by their roots, it is plain they would take to flight; for they wistfully eye the ground, they turn their backs on their foe, and seem ready to set out, in haggard disarray. They bend and curve towards the earth, where, rooted and powerless, they yield to the fury of the gale. Sometimes they halt in their growth, and from a small, slight trunk extend their branches indefinitely in a horizontal direction. On those shores where comminuted shells create a fine powdery dust, the tree is literally invaded and swallowed up by it. Its pores are closed, and air is denied it; it is suffocated, but, preserving its form, remains a tree of stone—the spectre of a tree, a mournful shadow which cannot pass away, but is a prisoner even in death.

Long before the Sea meets our gaze we hear, and we divine

* The north-western rivers are the Seine, Loire, and Garonne.

our vicinity to the awful despot. At first a distant, dull, monotonous sound salutes the ear. By degrees all other sounds yield to and are absorbed in this. Soon we remark the solemn alternation, the invariable return of the same note, a strong bass, which increasingly rolls and roars—more regular even than that oscillation of the pendulum which marks for us the minutes. But here the balance lacks the monotony of mechanical appliances. We perceive, or think we perceive, in it the trembling intonation of life. And, in truth, at the hour of the flow, when wave mounts upon wave, immense and electrical, there mingles in the stormy roll of the waters the rattle of the shells and of the thousand different creatures which they bring up from the depths. Then comes the ebb, and a hoarse murmur makes us understand that the tide is carrying back this world of living things to the Ocean's bosom.

How many other voices has it! Even when lightly moved, its wails and its deep sighs contrast with the silence of the gloomy shore, which seems to-day listening intently to its menacing billow, and, but yesterday, was soothed with a caressing wave. What will the Sea, too, shortly say to it? I will not anticipate. I will not here speak of the awful harmonies it will soon create—of its sublime duets with the rocks—the low hoarse thunders which it raises in the cavernous recesses—nor of those astonishing cries which seem to say, "Help! help!" No, let us contemplate it in its hours of gravity, when it is strong without being violent.

If the child and the ignorant always feel in the presence of this sphinx a stupor of admiration, and an emotion of pleasure rather than of fear, we must not be astonished. For ourselves, regarded from many points of view, it is still a great enigma.

What is its real extent? All we can really assert is, that it exceeds the area of the land. Over the surface of our globe

water is the rule, land the exception. But their relative proportion! Water, it is probable, occupies four-fifths; though some writers say two-thirds or three-fourths. It is difficult to be exact. The land increases and diminishes; is always in travail; here it sinks, and there it rises. Some Polar countries, discovered and mapped by former voyagers, are no longer found upon our modern charts. Moreover, innumerable islands, immense banks of madrepores and corals, are constantly forming and rising, to the great disturbance of geography.

The depth of the Sea is even less known than its extent. The first soundings, and these very few and uncertain in their results, have only just been taken.

The little venturesome liberties which we indulge in on the surface of the indomitable element, the audacity with which we traverse this vast unknown, are as nothing, can avail nothing, against the just pride of Ocean. It remains, in reality, still shut against us, and inaccessible. That there teems and stirs within it a prodigious world of life, war, and love—of every kind of product—we can well divine, and already we know something of it. But we can scarcely cross its threshold. We hasten to escape from an element foreign to our nature. If we have need of it, it has no need of us. It can do admirably without man. Nature seems to set small value upon having such a witness. God is there, alone with it.

The element which we describe as fluid, mobile, and capricious, does not really change; it is regularity itself. What constantly changes is Man, whose body (of which four-fifths, according to Berzelius, are water) will, by to-morrow, have evaporated. This ephemeral apparition, confronted by the grand immutable powers of Nature, has only too much cause to dream! Whatever may be his well-founded hope of immortal life for the soul, he does not the less grieve at the frequent deaths and sorrowful crises which every moment disturb the current of his existence. The Sea wears an aspect

of triumph. Whenever we approach it, a voice seems to issue from the depth of its immutability: "To-morrow thou passest away, but I—never! Thy bones shall crumble in the earth, and in course of centuries be reduced to dust, while I shall continue, majestic and indifferent, the grand, well-balanced life which, hour after hour, attunes me to the life of worlds remote."

How humiliating is the antithesis so harshly forced upon us, and, as it were, like a jest; especially on storm-beaten shores, where the Sea plucks from the cliffs the fragments which it hurls back at them, which twice every day it carries off, with an ominous clang, like that of bullets and iron chains! All young imaginations see in it an image of war and combat, and are, at first, affrighted. Then observing that there are limits to its fury, the child, with heart reassured, hates rather than fears the savage Thing which seems longing for its prey, and, in his turn, flings stones at his great roaring enemy.

In July 1831 I observed this kind of duel at Havre. A child whom I had there conducted into the presence of the Sea, felt her youthful courage rise, and grew indignant at its contemptuous defiance. She repaid war by war. The unequal strife was one to smile at, between the delicate hand of the fragile creature and the awful strength which took so little heed of it. But the smile passed when I thought how trivial was the life of this beloved being, when I remembered her ephemeral powerlessness, in face of the unwearying eternity which claims us all. Such was one of my first interviews with the Sea. Such were my reveries, saddened by the too truthful augury which I drew from that struggle between the Ocean I was to see again, and the child I shall see no more.

CHAPTER II.

THE SHORE, THE STRAND, AND THE CLIFF.

EVERYWHERE we may see the Ocean, and everywhere it will appear to our eyes equally formidable and imposing. Such it is when beating against the promontories which survey it in all directions: such it is—and then most terrible—in those vast but circumscribed areas where it is fretted and enraged by the encroaching shore; where it enters as into a prison, with violent currents which frequently hurtle against the rocks. We do not see it in its infinity, but we feel, we comprehend, and we divine it; and the impression is all the more profound.

And thus I found it at Granville—on that stormy shore of furious billows and roaring winds which marks the boundary between Normandy and Brittany. The rich and genial, though sometimes rather commonplace, gaiety of the beautiful Norman fields disappears; and at Granville—at the dangerous St. Michel-en-Grève—the traveller enters into an entirely different region. Granville is Norman in race, but Breton in aspect. It haughtily opposes its rock to the awful crash of the waters, which sometimes bring from the northward the discordant madness of the currents of the Channel, and sometimes roll from the west a long and constantly-increasing flood throughout its course of a thousand leagues, which strikes with all the accumulated force of the Atlantic.

I loved that curious and somewhat melancholy little town, which is supported by a distant fishery of a peculiarly dangerous kind. Each family knows that its maintenance depends on the chances of that lottery of human life and death : hence everything is pervaded with a serious air, which harmonizes well with the severe character of the coast scenery. I have frequently enjoyed the sadness of the evening ; either walking on the already darkling shore, or from the elevated town on the rocky summit watching the sun descend below a misty horizon. Its enormous disc, often tensely circled with black and crimson rays, sank into the deep, without pausing to create those celestial fantasies, those luminous landscapes, which elsewhere often enliven the view. In August, it was already autumn. There was no twilight. Scarcely had the sun disappeared before the wind freshened, and the dark-green waves flowed with a swift motion. One could see only a few shadows of women in their black cloaks trimmed with white. The sheep lingering in the scanty pasturage of the slopes—which overhung the shore eighty or a hundred feet—bleated plaintively.

The elevated but diminutive town stands with its northern face on the edge of a precipitous descent, black and chill, swept by an everlasting wind, fronting the open sea. Its houses are all mean. I lodged with a good man whose occupation was the composition of pictures out of sea-shells. Ascending by a kind of ladder to a small dark apartment, I saw, framed in a narrow window, this tragic spectacle. It impressed me as strongly as one which I had seen in Switzerland—seen also through a window, and by a sudden surprise—of the glacier of the Grindelwald. The glacier showed me an enormous monster of keen ice-spires advancing towards me : and that sea of Granville, an army of hostile billows marching simultaneously to the assault.

My landlord, though not old in years, was enfeebled and

fever-stricken. In this month of August he kept his window closed. While I examined his handiwork and conversed, I perceived that his intellect was weak. It had been shaken by a domestic misfortune. His brother had perished on that unhappy strand by a cruel accident. So the Sea was to him of ill omen, and appeared actuated by hostile feeling. Throughout the winter it lashed his casement with snow storms or icy winds. It would not suffer him to sleep. It smote the rock beneath him, through all the long and weary nights, without truce or repose. In summer it blinded him with measureless storms, and lightnings darting from world to world. At high tides the scene was still worse. The waters rose full sixty feet; and their furious spray, rising higher and yet higher, outraged him by dashing against his window. He was not even certain that the Sea would always be content with this: it might, in its hatred, some day play him a malignant trick. But he had no means of obtaining a securer asylum; and perhaps he was detained, in spite of himself, by an inexplicable magnetism. He could not have dared to break all at once with the terrible Genius, for which he entertained a certain reverence. He spoke of it but seldom, and I usually indicated without naming it: as the Icelander at sea dares not name the Ourq, for fear she should hear and fetch him. I still seem to see his wan countenance as he looked out upon the Ocean and exclaimed, "*It* makes me tremble!"

Was he a simpleton? Nay, he spoke with much good sense. He appeared to me a man of marked and interesting character; but he was acutely nervous and very finely organized—too much so for such impressions.

The Sea makes many madmen. Livingstone brought from Africa a courageous and intelligent man, who had braved lions. But he had never beheld the Sea. When he embarked on board ship, and met at once with the twofold surprise of the formidable element and man's marvellous arts, it proved

more than his mind could bear. He became delirious : though carefully watched, he found means to escape, and blindly flung himself headlong into the waves which terrified and yet fascinated him.

On the other hand, the Sea has so powerful an influence on those who have long confided in it, and have lived with it on familiar terms, that they can never tear themselves away from it. In a little seaport I have seen aged pilots who, on account of their infirmities, have resigned their posts ; but, unable to console themselves, they drag through a wretched existence, with wandering brains.

On the highest point of St. Michel a platform is shown you which bears the name of the *Madmen's*. I know no place better adapted to drive men mad than that tower of vertigo. Imagine to yourself a great plain as of white ashes spreading all around, and always lonely—a waste of equivocal sand, whose false sweetness is the most dangerous snare. It is earth, and yet it is not ; sea, and yet it is not : nor is it fresh water, though subterranean brooks incessantly plough the soil. Rarely, and only for a few moments, a boat will venture upon it. If you cross it when the tide has receded, you run the risk of being ingulfed. Of this I may well speak, for I was nearly a victim. A light vehicle in which I was riding disappeared in two minutes, horse and carriage : by a miracle I escaped. But when on foot I sank. At every step I felt a frightful shivering—like an appeal from the abyss, which softly called me, invited and attracted me, and drew me beneath. I arrived, however, at the rock—at the gigantic abbey, cloister, fortress, and prison of cruel sublimity, worthy indeed of its surrounding landscape. This is not the place to describe such a monument. On a huge block of granite it rears itself—mounting and still mounting indefinitely, like a Babel of Titanic architecture, rock upon rock, century upon

century, but also dungeon upon dungeon. On the lowest stage, and in peace, the monks; above, the cage of iron constructed by Louis XI.; still higher, the cage of iron of Louis XIV.; and, highest of all, the present prison. And all this situated in the heart of a whirlwind, in the midst of eternal commotion. It is the grave—without its calm.

But is it the fault of Ocean that this strand is so treacherous? Not at all. There, as elsewhere, it comes in clamour and strength, but loyal. The crime is really Earth's, whose astute immobility always appears so innocent, while underneath the shore it filters the waters of the streamlets in a sweetish, whitish mixture, which deprives it of all solidity. But, above all, the crime is Man's—is due to his ignorance and his negligence. In the long ages of barbarism, while he dreamed in legends and founded the grand pilgrimage of the archangelic conqueror of Satan, Satan took possession of this forsaken plain. The Sea is utterly innocent. Far from doing mischief, it brings, on the contrary, with its ever-threatening billows, a treasure of fertilizing salt, surpassing the mud of Nile, which enriches the tilled land, and creates the attractive loveliness of the ancient marshes of Dol, nowadays transformed into gardens. It is a somewhat passionate mother, this Sea; but still it *is* a mother. Rich in fish, it accumulates upon Cancale, which lies opposite, and upon other banks, millions and tens of millions of oysters; and with their comminuted shells it has communicated that prolific vitality which develops itself in grasses and fruits, and covers the meadows with flowers.

We must endeavour to gain a true intelligence of the Sea; not yielding to the false ideas originated by the adjacent land, nor to the terrible illusions which the simple grandeur of its own phenomena—the passing outbursts, which are often benefits—will not unnaturally produce.

CHAPTER III.

THE SHORE, THE STRAND, AND THE CLIFF.

THE shore, the strand, and the cliff show us the Sea under three aspects, and always with advantage. They explain it,—they translate it,—they bring into harmony with us that grand Power, which is so wild and fierce on the surface, but at bottom is divine, tender, and friendly.

The advantage we gain from the cliffs is this, that at the foot of their lofty walls we can appreciate much more sensibly than elsewhere the tidal motion, the respiration, or, let us say, the pulse of the Sea. Imperceptible in the Mediterranean, it is strongly marked in the Ocean. Ocean breathes as we do—in harmony with our internal movement, with that from on high. It compels us to count incessantly with it, to compute the days and hours, to look up to heaven. It recalls us to ourselves and to the world.

When I seat myself on the cliffs—on those of Antifer, for instance—I behold this immense spectacle. The Sea, which but now seemed like a dead body, has shuddered: it trembles—the first sign of a grand movement. The tide, having swirled past Cherbourg and Barfleur, has swept violently round the lighthouse point: its divided waters skirt the Calvados and accumulate at Havre; thence they come to me—towards Étretat, Fécamp, Dieppe—to plunge themselves into the

channel, despite the currents of the North. It is my place now to be on my guard, and closely watch its hour. Its height—scarcely worth notice at the dunes, or hills of sand, which one can everywhere ascend—here, at the foot of the cliffs, compels our attention. This long wall, some thirty leagues in extent, has no steps or ladders. Its narrow openings, which form our little harbours, occur at wide intervals.

Observe you, then, at low tide, with all the keener curiosity, the superimposed strata where the history of the globe records itself—like gigantic registers in which the accumulated ages offer to your gaze the open book of Time. Every year gnaws away a page. It is a shattered world, which the Sea ever eats into from below, but which rains and frosts still more violently attack from above. The wave dissolves the chalk; seizes, breaks off, and continually rolls to and fro the flint, rounding it into rollers. This rough labour converts our coast, so fertile on its inland side, into a maritime desert. Few, very few ocean-plants survive the incessant grinding of the constantly-clashing shingle. The molluscs and shell-fish are afraid of it: the very fish keep at a secure distance. How great the contrast between a country-side so gentle and so humanized, and a sea so inhospitable!

One can only see it fitly from above. Below, the harsh necessity of walking over a crumbling, rolling soil of bullet-like stones renders the narrow strip of beach impracticable, and converts the briefest walk into a violent gymnastic exercise. We must loiter on the summit—where superb villas, beautiful woods, magnificently-cultivated fields, and gardens, extend to the very margin of the Sea—and contemplate with pleasure that majestic highway of the Channel, thronged with barques and vessels, which separates the shores of the two great empires of the world.

Earth and Sea! What more? Both have here a charm.

Yet he who loves the Sea for itself, its friend, its lover, will rather go in quest of it to a less varied scene. For establishing a close relationship with it, the great sandy shores (if the sand is not too soft) are far more convenient. They permit you to enjoy almost endless rambles; they suffer you to dream; they allow mysterious expansions of sympathy between Man and the Ocean. For myself, I have never complained of those vast unbounded arenas which have filled other minds with so much weariness. I do not find myself alone in them. I go, I come, I feel it. It is there, the great friend and companion. When not too violently agitated, or in too wrathful a mood, I venture to address it; and it does not disdain to answer. Ah, how many things have we said to one another in those tranquil months when the noisy crowd has been absent from the illimitable shores of Scheveningen and Ostend, Royan and Saint-George's! There, in our prolonged *tête-à-tête*, a certain degree of intimacy has been established. One gains there a new sense with which to understand its sublime language.

Ocean appears melancholy indeed, when, viewed from the towers of Amsterdam, the muddy Zuyder Zee seems like a leaden lake; or where, at the dunes of Scheveningen, the rising, gathering waters threaten to break through the frail dyke. Yet this combat interests *me;* this land, sad and grave as is its aspect, has an attraction which I cannot disown: it is the effort, the creation, and the invention of man. The Sea delights me also through the wealth of fecund life which I know to be stored within its bosom. It is one of the most thickly-peopled regions of the world. On St. John's Eve, when the fishing season commences, you should go and see the ascent from its depths of another sea—the "sea of herrings." The limitless watery plain will not have verge or space enough for this living deluge—one of the most triumphant manifestations of the unbounded fertility of Nature. It

is this which in anticipation I behold in yonder sea, and in those pictures where genius has seized its profound characteristic. In the Louvre I have been attracted by the sombre *Estacade* of Ruysdael more powerfully than by any other canvas. And why? In the iron-red hues of those electricized waters I do not feel the chill of the Northern Ocean; but, on the contrary, the ferment and the rush of life.

If, nevertheless, I were asked on what coast or shore I gain the loftiest impression of Ocean, I should say, on that of Brittany; and especially on those wild, sublime promontories of granite which terminate the ancient world—on that bold headland which defies the tempests and dominates over the Atlantic. Nowhere have I been more acutely sensible of that grand and lofty sadness which is the best influence of the Sea. But it is needful I should explain this.

There is a sadness, and a sadness—that of the womanly, and that of the strong nature—that of over-sensitive souls which weep for their own woes, and that of disinterested hearts which contentedly accept their lot, and pour out continual benedictions upon Nature; while, not ignorant of the ills of the world, they draw from their very sorrow fresh strength to act or create. How many of us require to steep our spirit very frequently in that condition which may be named "heroic melancholy!"

When I first visited this country, some thirty years ago, I took no account of the grave attraction it exercised upon my mind. At bottom, this attraction lies in its sublime harmony. Elsewhere, without being able to explain it to oneself, one becomes aware of a discordance between the soil and its inhabitants. The handsome Norman race, in those districts where it retains its purity of blood, and has preserved the curious reddish tint of Scandinavia, has no sympathy with the earth it accidentally colonizes. But, on the contrary, in Brittany, on the most ancient geological formation of the globe, on a soil

of flint and granite, is planted the primitive race—a people also hewn out of granite. A rough race, of great nobility of nature, with a flinty acuteness all their own. And thus, as Normandy progresses, Brittany decays. An imaginative and *spiritual* people, the Bretons are partial to absurdities, impossibilities, and exploded fictions. But if they lose in so many things, they retain one treasure, and that the rarest—*character*.

If you would fain escape for awhile from insipid Anglicism, from that loud vulgarity which is positive about everything, and from the oppression of silly pleasures, go and seat yourself on the rocky cliffs of the Bay of Douarnenez, on the promontory of Penmark. Or, if the wind blows fresh, put yourself in a boat and visit the low islands of Morbihan, where the sea brings a warm, genial flood, with so soft a motion that you cannot even hear it. Brittany, in its tender moods, is very tender. In its archipelagoes flows, you would say, the river of the dead. But where it is strong and bold, it rises into sublimity.

In 1831 I was sensible only of sorrows, which have since passed into my history. I could not then understand the character of this sea. But it is in its loneliest bays and among its wildest rocks that it reveals its true gaiety, and shows itself living and joyous in the consciousness of a lofty existence. These rocks appear covered with a layer of gray asperities; animated beings—a world of life which, when left dry by the receding tide, will shut itself up in darkness. It opens its little windows when the good Sea, its nurse, brings it a supply of food. There ever toils that crowded population of tiny stone-borers, the sea-urchins, or *echini*, which M. Caillaud has so closely observed and so admirably described. Their opinions are exactly the reverse of ours. Beautiful Normandy terrifies them; they have a horror and a punic dread of the rough pebbles of its cliffs, which would

grind and crush them to death. Nor would the crumbling chalk of Saintonge, and its pleasant shores, reassure them. They do not care to plant themselves in a locality which to-morrow will cease to exist. On the contrary, they are only happy when they feel beneath them the immutable soil of the Breton rocks.

Let us learn from them not to trust to appearances, but to truth. The enchanting shores which the most seducing flora decorates are exactly those which marine life avoids; they are rich, but only in fossils; of great interest for the geologist, for he there derives his information from the bones of the dead. The harsh rough granite, on the other hand, sees *beneath* it the teeming waters; sees *upon* it another living world—the interesting and unassuming race of molluscs—those poor tiny labourers in whose toilsome life consists the sober charm and the morality of the Sea.

"Everywhere, a profound silence! These countless myriads are dumb; they tell me nothing. Their life is bound up in themselves, wholly unconnected with me; and for me their life is no more than death. Solitude!"—thus speaks a woman's heart—"a grand but melancholy solitude.....I do not feel at ease.".....

There you are in the wrong. All here are friends. These tiny organisms say nothing to man, but labour for him. They abandon the duty of discourse to their sublime parent, the Ocean, who speaks in their place; and they explain themselves by his lofty voice.

Between the silent earth and the dumb races of the Sea is here carried on a grand, sympathetic, and pregnant dialogue—the harmonious agreement of the great "I" with himself—that charming contention which, in truth, is love.

CHAPTER IV.

THE CIRCLE OF WATER, THE CIRCLE OF FIRE:—RIVERS OF THE OCEAN.

EARTH has scarcely ever bestowed a glance upon herself, without contrasting and preferring herself to Heaven. Geology, though in its very youth, has raised a Titan voice against its elder sister Astronomy, the haughty queen of the sciences. "Our mountains," it says, "are not scattered at random, like the stars in the firmament; they are arranged in systems, where we find the elements of a general order, of which the celestial constellations do not present a single indication." This bold and passionate exclamation proceeds from a man not less modest than illustrious,—M. Elie de Beaumont.

Undoubtedly we have not yet distinguished the order, though probably very complete, which reigns in the apparent chaos of the Milky Way; but the more visible order of the terrestrial surface, resulting from the unfathomable revolutions of the interior of our globe, has still, and will ever have, for the most ingenious science, its shadows and its mysteries.

The outlines of that great mountain raised above the waters, which is properly called Earth, present to our gaze numerous dispositions of a tolerably symmetrical kind, which, nevertheless, we cannot yet refer to one general system. These dry and elevated portions are more or less extensive,

according as the water uncovers them. It is the Sea, as their boundary-line, which really determines the form of the continents. And it is with the Sea that all geography should properly begin.

Let us add a great fact, discovered within the last few years. While the earth is marked by some apparently discordant features—as, for example, the New World stretching from north to south, and the Old World extending from east to west—the sea, on the contrary, is characterized by a remarkable harmony, an exact correspondence between the two hemispheres. It is in the fluid part of our globe, which we thought so capricious, that perfect regularity exists. The most symmetrical and the best-balanced portion is precisely that which appeared the least under control, and the very plaything of circulation. The bony skeleton and the vertebræ of the mighty animal possess their singularities, for which, as yet, we are unable to account. But its vital movement—which creates the ocean-currents—which converts salt water into fresh, soon re-converted into vapour, to be again absorbed in the salt water,—all this admirable mechanism is as perfect as that of the circulation of the blood in the highest order of animals. Nothing more closely resembles the constant transformation taking place in our venous and arterial blood.

The surface of the globe appears still more intelligible if we classify its regions, not by mountain chains, but by *maritime basins.*

Southern Spain bears a closer likeness to Morocco than to Navarre, and Provence to Algeria than to Dauphiny. Senegambia may more justly be compared with the valley of the Amazons than of the Red Sea; and Amazonia has more analogy with the humid regions of Africa than with those which lie in its rear, Chili and Peru.

The symmetry of the Atlantic also is much more striking in its under-currents than in its superficial winds and breezes. Their action powerfully aids in creating these analogies, and in establishing what may be called *the brotherhood of the shores.*

The principle of geographical unity, and the elements of classification, will be more and more sought in the *maritime basin,* where the waters, and those faithful messengers the winds, found the affinity and assimilation of opposite coasts. Less and less shall we seek that idea of geographical unity in the mountains, whose two flanks, often in contradiction to one another, display under the same parallels of latitude an entirely different population and flora — here the invariable summer, and there, two paces distant, the unchangeable winter. The mountain rarely determines the unity of a country; more frequently causes its duality, its divorce, and its discordances.

This view—a view sprung from the brain of genius—belongs to Bory de Saint-Vincent. The recent discoveries of Captain Maury, and the laws he has laid down, confirm it in a thousand ways.

In the vast valley of the Sea, under the two-fold mountain mass of the great continents, we distinguish, correctly speaking, two basins only,—

1. The basin of the Atlantic;
2. The great basin of the Indian Ocean and the Pacific.

We cannot designate as a basin the undefined cincture of the enormous Austral Ocean, which has neither coast-line nor boundary, and towards the north does but gird round the Indian Sea, the Sea of Coral, and the Pacific.

The Southern Ocean, taken by itself, is of greater extent than all the seas. It covers nearly one-half the surface of the globe. According to all appearance, its depth is com-

mensurate with its extent, while recent soundings of the Atlantic only indicate 10,000 or 12,000 feet. Ross and Denham obtained, in the Southern Ocean, a depth of 14,000, 27,000, and even 46,000 feet. Consider, also, the huge mass of the Antarctic ice, infinitely more vast than the ice-masses of the North. It will not be far from the truth if we simplify conclusions by saying, The Southern Hemisphere is the world of waters, and the Northern that of land.

He who, quitting Europe, wishes to traverse the Atlantic, having happily escaped from these harbours of ours, so frequently barred by the east winds, and crossed the variable zone of our changeful seas, speedily passes into that calm weather, that eternal serenity, which the bland trade-winds of the north-east establish in sea and sky. All Nature smiles; there is no disquietude. But as he advances towards the Equator the vivifying breeze declines, and the air grows suffocating. He enters the Belt of Calms, which, prevailing under the Equator, unchangeably separates the trade-winds of our Northern from those of our Southern Hemisphere. Heavy clouds oppress him; tremendous rains incessantly descend. He becomes gloomy and fretful; but were it not for this sombre canopy, with what fiery arrows the sun would smite the mirror of the Atlantic! But for these deluges which flood the other side of the globe, how the Indian Ocean and the Coral Sea would toil in the craters of their ancient volcanoes! That black aggregate of clouds, formerly the terror and barrier of navigators—that sudden night, extended over the face of the waters—is precisely the salvation, the protecting facility which smoothes our passage for us, and enables us to regain in the South a glowing sun, a cloudless sky, and the genial breath of the constant winds.

Naturally enough, the equatorial heat raises the water in dense clouds of vapour, and forms that sombre pall.

The observer who, from some other planet, should contemplate this terrestrial orb, would see it overspread by a ring of clouds, just as we see the ring of Saturn. If he inquired its use, one might answer, It is the regulator which, alternately absorbing and restoring, equilibrizes the evaporation and precipitation of the waters, distributes the rains and the dews, modifies the heat of every country, interchanges the vapours of the two hemispheres, and borrows from the Austral World the wherewithal for the rivers and streams of our northern clime.—Marvellous solidarity! The virgin forests of South America fraternally water the fruits and flowers of Europe with the condensed clouds of their warm, genial breath. The air that reinvigorates our frames is the tribute which a hundred Asiatic islands, and the rich flora of Java and Ceylon, confide to the wings of the clouds, as they revolve with the revolving earth, and inspire it with fresh life.

Place yourself—I mean, in imagination—on one of the volcanic islands which besprinkle the Pacific, and look towards the south. Beyond New Holland you see the Austral Ocean besieging with a circular flood the two extreme points of the Old and New Continents. No land in the Antarctic World, or only some small islets, or those fabulous circumpolar regions which discoverers lay down in their charts to see them disappear again, and which, mayhap, are in reality fields of ice. Waters without end—always and everywhere, the waters!

From this same point of observation, in contrast with the circle of the Antarctic Seas, you may note, towards the east, towards the Arctic Hemisphere, what the geographer Ritter has named the Circle of Fire. To speak more precisely, it is a loose ring—a slackened chain—formed by volcanoes: first by those of the Andes, then by the heights of Asia, and, finally, by the innumerable groups of basaltic islands with

which the Eastern Ocean swarms. The first volcanic cones, those of America, present over upwards of one thousand leagues a series of sixty gigantic Pharoses, whose continual eruptions overawe the rugged coast and the remote waters. Beyond, from New Zealand to north of the Philippines, are eighty still active, besides numbers now extinct. Continuing our survey northward, from Japan to Kamtschatka, we count fifty burning craters, whose flames illuminate even the Aleutian Archipelago and the gloomy Arctic Seas.* Altogether, three hundred active volcanoes dominate in their circle of fire the Eastern World.

On the other side of the globe, our Atlantic Ocean presented an analogous aspect prior to the revolutions which crushed out most of the volcanoes of Europe, and annihilated the old continent of Atlantis. Humboldt is of opinion that this great ruin, so strongly attested by tradition, is only too authentic. I venture to add that the existence of this continent was logically necessary to the general symmetry of the world, to make our division of the globe harmoniously correspondent with the other. There towered, along with that Peak of Teneriffe which still flames and seethes—with our extinct volcanoes of Auvergne, the Rhine, and Hereford—the burning mountains which gradually undermined Atlantis. In their totality they constituted the counterpart of the volcanoes of the West Indies and other American craters.

From these active or extinct volcanoes—of India and the Antilles, of the Cuban Sea, and of the Javanese Sea—issue two enormous rivers of warm water, whose mission it is to revive the frozen North, and which may aptly be styled the two aortas of the globe. They are furnished, either at their sides or underneath, with counter-currents which, bringing down the cold water of the Pole, compensate for the dispersal

* See the works of Léopold von Buch, Karl Ritter, and Von Humboldt.

of the warm water, and restore the equilibrium. To these two hot and excessively saline currents the cold currents contribute a mass of the freshest water, which returns to the Equator,—the great electric furnace, where it gains salt and heat.

These rivers of warm water, narrow at first, and only some twenty leagues in span, long retain their vigour and energetic individuality, but, gradually intersecting and cooling, they also dilate, until they attain a breadth of one thousand leagues. Maury calculates that the current which starts from the Caribbean Sea, and strikes northward towards our own shores, displaces and modifies a fourth part of the waters of the Atlantic.

These grand features of oceanic life, though only recently observed, were always as conspicuous as the continents themselves. Our grand Atlantic artery, and its sister the Indian artery, are sufficiently distinguished by their colour. On both sides alike, it is a great blue torrent which traverses the green ocean-waters—a deep blue—nay, so dark a purple that the Japanese denominate theirs, the *Black River*.

The source of our Atlantic current, between Cuba and Florida, is easily discernible: it springs, boiling, from its caldron, the Gulf of Mexico, and, hot and very salt, it runs in a well-defined channel between two emerald-green walls. Ocean's task is difficult: it encloses, it compresses, but cannot penetrate it. I know not what intrinsic density, what molecular attraction holds these blue waters so closely bound, insomuch that rather than admit the green water, they accumulate in a ridge, or vault, sloping both to right and left; and every object thrown into it drifts and glides off, being on a higher level than that of Ocean.

Rapid and full, it flows at first to the northward, skirting the United States; but on arriving at the extremity of the Great Newfoundland Bank, its right arm strikes to the east.

Its left arm, becoming a submarine current, stretches towards the Pole, and there creates the warm, or, I should rather say, the open sea, which has recently been discovered. As for the right arm, which expands to an immense breadth, when, weak and weary, it reaches Europe it encounters Ireland and England, which subdivide its waters already divided at Newfoundland. Swooning, and lost amid the Ocean, it retains strength enough to mitigate slightly the Norwegian climate, and finds means to convey to the shores of Iceland the woods of America, without which that unhappy island, lying frozen in the shadow of its volcano, would surely perish.

These two brothers, the Indian and the American, have this in common: that, issuing from the Equator, the electric centre of the globe, they carry with them wherever they go prodigious powers of creation and agitation. On the one hand, they seem the deep womb, the soft and genial cradle, of a world of living organisms. On the other, they are the source and channel of the tempests; the winds and the waterspouts plough their surface. So much gentleness, and yet so much fury: is it not a contradiction? No; it only proves that the fury is all external, and does but disturb the upper and shallower strata. In the deeps it is unknown. The feeblest of creatures, the atomic shells, the microscopic medusæ, fluid beings which a nothing dissolves, sail in undisturbed tranquillity beneath the storm.

Few of them reach our shores; they advance as far as Newfoundland, where the cold polar current overtakes, seizes, and destroys them. Newfoundland is the great ossuary, or charnel-house, of these voyagers stricken by the cold. The lightest, though dead, remain suspended, until they fall like snow to the ocean-bed. There they deposit those banks of microscopic shells which cover the bottom from Ireland to America.

Maury calls the two warm rivers of India and America the "two Milky Ways of the Sea."

Alike in colour, heat, and direction, and describing exactly the same curve, they have not the same destiny. The American, at the very outset, passes into a stormy sea, opening northward, the Atlantic, which releases and hurls against it the floating legions of the polar ices. There it expends its heat. On the contrary, the Indian current, winding at first through a maze of islands, finally debouches in a pent-up basin, well guarded against the north. For a long time it continues unchanged—warm, electric, and creative—and traces upon the globe an enormous trail of life.

Its centre is the apogee of terrestrial energy, in vegetable treasures, monsters, spices, poisons. From the secondary currents which it throws off to the south results another world, that of the Coral Sea. There, over an area as wide, says Maury, as that of the four continents, the polypes conscientiously build up the myriads of isles, banks, and reefs which intersect that sea; reefs now dangerous to, and accursed of, the mariner, but which, continually rising and uniting, will one day form a continent, and—who knows?—in some terrible cataclysm of the future, provide a refuge for the human race.

CHAPTER V.

THE PULSE OF THE SEA.

OUR earth, as Jean Reynaud observes, in a fine paper in the *Encyclopédie*, is not solitary. The infinitely complex curve which it describes expresses the various forces and diverse influences which act upon it, and testifies to its relations and communications with the grand inhabitants of the firmament.

Its hierarchical relations are particularly conspicuous with its sovereign the sun, and the moon, which, in order to become its servant, has the more power over it. Just as the flowers of the earth turn towards the orb of day, so does the earth which nourishes them look and aspire towards it. In its most mobile portion, its fluid mass, it raises itself and shows how deeply it feels its attraction. It overflows its level, it rises as far as may be, and towards the friendly stars twice every day it swells its bosom, and addresses to them at least a sigh.

And does it not also feel the attraction of other globes? Are its tides influenced only by the sun and moon? So every philosopher asserts, so all the world of seamen believe. They still cling to the very imperfect results obtained by Laplace, and hence these terrible errors which induce so many shipwrecks. In the dangerous shallows of Saint-Malo, a

mistake of eighteen feet has occurred. It was in 1839 that Chazallon, who had nearly perished by these errors, began to discover and calculate the secondary but very considerable undulations which modify the general tide under different influences. Planets less dominant than the sun and moon have, undoubtedly, their share in equilibrizing the waters of the earth.

Under what law? Chazallon says:—"The undulations of the tide in a harbour follow the law of vibrating chords." A grave enunciation, of wide sweep, which leads us to understand that the relations of the stars to one another are the mathematical relations of the celestial music, as said the philosophers of antiquity.

The earth speaks to her sister planets through her great tide and her partial tides. Do they reply? One might think so. They too may uplift their fluid elements in sympathy with the impulse of our sphere. The mutual attraction, the tendency of each star to emerge from its egoism, should syllable sublime dialogues through the halls of space. Unhappily, the ear of man catches the least part of them.

We have another point to consider. It is not at the moment of the passage of the influencing star that the sea yields to it. It does not exhibit the eagerness of a servile obedience. It needs time to perceive and follow the concussion. It must summon its sluggish waters, subdue their power of inertia, attract and gather together the more remote. The terribly swift rotation of the earth incessantly displaces the points submitted to the planetary attraction. Add that the embattled host of waves, in its simultaneous march, has to conquer all the opposition of natural obstacles—islands, capes, straits, the varying direction of the shores, the no less tenacious impediment of winds and currents, and the rivalries of the rivers which, descending from the mountains and hurrying

down their steep declivities, swollen by melting snows or swerved aside by a hundred unforeseen accidents, throw themselves across, and divert, the regular movement, after the most terrible encounters. Ocean does not yield. The display of force made by the mightiest rivers does not intimidate it. It gathers up the waters hurled against it, and rolls them back in a mountain mass as far as Rouen or Bordeaux; rolls them back with so awful a fury that one might say it would make them remount the very mountains.

These widely different obstacles create some apparent irregularities in the tides which impress and embarrass the mind. Nothing is more surprising than the contradictory hours of their occurrence at closely neighbouring ports. One tide at Havre, for example, is equal to two at Dieppe. It is a glorious triumph of human genius to have reduced to calculation such complicated phenomena.

But under this external movement the Sea conceals those inner motions of the currents which traverse it at different depths. Superimposed in successive stages, or flowing laterally in opposite directions—warm currents, cold counter-currents—they unite to accomplish the circulation of the Sea, the exchange of the salt and fresh waters, and the alternative *pulsation* which is the result of all this. The warm throbs from the Line to the Pole, the cold from the Pole to the Equator.

Do I mean that these currents, tolerably distinct as they are, and but slightly mingled, can strictly be compared, as some writers have compared them, to the vessels, veins, and arteries of the higher animals? Undoubtedly not to the letter. But they bear a certain resemblance to that less definite circulatory motion which naturalists have recently discovered in some inferior organisms, the molluscs and annelidæ. This lacunar

circulation supplies and prepares the vascular; the blood expands in currents before tracing out precise channels.

Such is the Sea. It may be likened to a huge animal arrested in the first stage of its organization.

Who has revealed the currents, those regular fluctuations of the abyss into which we never descend? Who has taught us the geography of the shadowy waters? Those who float or live therein—animals and vegetables.

We shall see how the whale, how the atomic shells of the foraminiferæ, how the American woods, transported as far as Iceland, have combined to indicate the warm river which flows from the Antilles to Europe, and the cold-water current which joins it at Newfoundland, and skirts it, or passes beneath it, dissolving its ice-masses into far-spreading mists.

A red cloud of animalcules, storm-driven from the Orinoco to France, has explained the great aerial south-western current which refreshes Europe with the rains of the Cordilleras.

But for the constant exchange of the waters effected by the currents in the ocean-depths, the Sea would in many places be filled up with salts and detritus. It would become a Dead Sea, which, having neither outflow nor movement, sees its shores loaded with salt, its plants encrusted with crystals. The winds which simply sweep across it become burning, barren, winged with famine and death.

Numerous desultory observations on the air currents, the ocean currents, the seasons, the winds, the tempests, treasured up in the tradition and memory of fishermen and sailors, frequently perish with them. The guide of navigation, meteorology, so long as it was not centralized, seemed vague and fruitless, and men began to deny its value. The illustrious Biot closely investigated the little it had hitherto accomplished. Nevertheless, on the two coasts, Europe and America, certain

assiduous pioneers established the rejected science on the basis of observation.

The last and most famous, Maury, the American, courageously undertook the task at which an entire administration had recoiled, the scrutiny and orderly arrangement of innumerable log-books, these informal and frequently mutilated documents brought home by ship captains. These extracts, set forth in tables where all concordant facts are collected under their proper heads, have furnished certain rules and general axioms. A nautical congress, held at Brussels, has decided that carefully noted observations shall henceforth be centralized at one depôt, the Washington Observatory.

Such is the noble homage paid by Europe to young America, to the patient and ingenious Maury, the poet-philosopher of the Sea, who has laid down its laws, nay, who has done yet more; for by his energy of soul and love of Nature, as well as by the positive character of his results, he has carried the world with him. His charts and his first work, of which 150,000 copies were printed, have been liberally distributed to the marine of every nation by the United States Government. Numerous eminent men, in France and Holland—Jansen, Tricaut, Julien, Margollé, Zurcher, and others—have undertaken the task of interpreting and promulgating the opinions of this apostle of the Sea.

Why has America accomplished, in this respect, so much more than we? America is—Desire. She is young, and burns to put herself in harmony with the globe. On her magnificent continent, though girt round by so many States, she thinks herself alone. So remote from her mother Europe, she turns her eyes towards this centre of civilization, as earth turns towards the sun, and everything which brings her nearer to the great luminary thrills her with emotion. Of this we may judge by the impressive festivities celebrated on the completion of the submarine telegraph which married the two

shores, bringing answer and reply in the brief interval of a few minutes; so that the two worlds, henceforth, might have but one thought!

Maury, with all the power of true genius, has demonstrated the harmony existing between the Ocean and the air. Such as the maritime Ocean is, so is the aerial. Its alternating movements, and its interchange of elements, are completely analogous. It distributes heat over the surface of the earth, and determines the conditions of dryness or humidity. The latter it absorbs from the seas, from the infinite space of the central ocean, from the great tubes of the universal caldron. Dryness, on the contrary, it acquires by passing over the scorched and burnt-up deserts, over the great continents, and the icy glaciers—which are the true intermediary poles of the world—and which exhaust it of its last drop of moisture. The warm breath of the Equator, and the icy influences of the Poles, by producing an alternate density and lightness of vapour, causes it to flow in horizontal currents and counter-currents, which are incessantly shifting their places. At the Equator, the heat which lightens the vapours and floats them upwards, creates ascending currents, which, before dispersing, hover awhile in the gloomy reservoir that circles our globe, as I have said, with a belt of clouds.

Thus, then, there exist other aerial and maritime pulsations in addition to the pulses of the tide. The latter is an external effect, produced by planetary influences; the former are intrinsic to the earth—nay, they are life itself!

In Maury's book,* which, in my opinion, is a masterpiece of genius, we find it stated: "The most obvious agent of the maritime circulation, heat, could not of itself suffice. There is another, not less, but far more important—salt."

* "The Physical Geography of the Sea."

Salt is so abundant in the Sea, that if we could accumulate the entire amount on the surface of America, it would form a mountain 4500 feet in height, with the continent for its base.

The saltness of the Ocean, though never greatly varying, increases or diminishes according to the locality, the currents, the proximity of the Equator or the Poles. And according as it is more or less salt, Ocean is light or heavy, more or less mobile. This continual combination, with all its variations, induces a swifter or slower motion of the waters—that is, it creates the currents: *horizontal* currents, in the bosom of the Sea; *vertical* currents, ascending from the Sea to the air.

M. Lartigue, a Frenchman, has filled up, with much ingenuity, several lacunæ, and corrected numerous inaccuracies which occur in Maury's work. But the American writer, anticipating that this would be the case, nowhere conceals the points in his system which he thinks imperfect. He professes, in reference to various details, to give only hypotheses. Sometimes he is clearly uncertain, dreamy, and anxious. His book, so thoroughly honest and truthful, permits us easily to detect the internal struggle taking place between two rival influences: *Biblical literalism*, which represents the Sea as a thing created by God at one grand impulse, a machine revolving under His hand; and the modern sentiment, *sympathy with Nature*, which looks upon the Sea as a living organism, as a vital force, almost as a person, as the living soul of the world engaged in a perpetual work of creation.

It is curious to trace in this book its author's gradual approximation to the latter point of view by an irresistible tendency. At first he explains whatever he can by mechanical and physical causes—as by gravity, density, heat, and the like. But this will not suffice. Under certain circumstances he then brings into play such and such a molecular attraction, such and such a magnetic action. This, too, is not sufficient.

He then frankly recurs to the physiological laws which govern life. He endows Ocean with pulse and arteries—ay, and even with a heart. Are these mere forms of expression, mere poetical comparisons? Not so, indeed. He cherishes—and it is the secret of his genius—an overruling and invincible feeling of the personality of the Sea.

Herein lies the source of his power, of his influence over his delighted readers. Prior to Maury, the Sea was a thing for the use of the sailors who ploughed its waters. Owing to his labours, it has become an individual being; all men recognize in the Ocean an impetuous and formidable mistress whom they adore, and would fain subdue.

He loves, ay, he loves the Sea. But, on the other hand, every moment he restrains himself and pauses, lest he should trespass beyond the limits wherein he would wish to rest contented. Like Swammerdam, Bonnet, and many other devout spirits and illustrious philosophers, he fears lest, by interpreting Nature too much by the help of Nature, he should be unjust to God. An unreasonable timidity! The more we demonstrate everywhere the existence of life, the more shall we make known to man the great Soul, the adorable Unity of all created beings, through whom they beget and create themselves. Where, then, will be the peril if we discover that the Sea, in its incessant aspiration after an organized existence, is the most active form of the eternal Desire which formerly called this globe out of chaos, and is ever exercising its creative energy?

That salt-water Sea, which, like blood, has its pulses, its circulating processes, and its heart (for so Maury names the Equator), where it interchanges its two currents,—are we certain that a being so endowed is not more than a *thing*, an *inorganic* element?

Behold this magnificent dial, this mighty steam-engine which imitates, with such wonderful exactness, the movement

of the vital forces! Is this a freak of Nature? Or shall we not rather believe that it contains in its masses a certain something of animal life?

A grand fact which Maury puts before us, but only secondarily and incidentally, is, that the living infinity of the Sea, the myriads upon myriads of organisms which it incessantly makes and unmakes, absorb the milk of life, the foam mingling with its waters, and drawing from these their various salts, create themselves and their shells, and accomplish other marvellous achievements. Thus, by their continual labours, they reduce the saltness of the Sea, lessen its specific gravity, and consequently increase its movement and circulation. In the great laboratories of animal organization—the Indian Sea and the Coral Sea, for instance—this force, elsewhere less remarkable, may be seen in all its real immensity.

"Each of these imperceptible beings," says Maury, "alters the equilibrium of the Ocean; they harmonize it, and are its compensators." Is this saying enough? Shall we not rather speak of them as its essential motors, which have created its great currents, have set the machine in motion? Who knows but that this vital *circulus* of the marine animal world may be the starting-point of the entire physical *circulus*—that the *animalized* Sea may communicate the eternal impulse to that *animalizable* Sea, which is as yet unorganized, but demands only existence, and stirs already with its coming life?

CHAPTER VI.

THE TEMPESTS

"FROM time to time commotions take place in the Sea whose object seems to be to secure the epochs of its labours. These phenomena may be regarded as the *spasms* of the Sea."*

Here he refers more particularly to the abrupt movements which apparently proceed from below, and, in the Asiatic Seas, are equivalent to actual tempests. The causes which he assigns for them are various:—1st, The violent collision of two tides or currents; 2nd, The sudden superfluity of rain-waters on the surface; 3rd, The breaking up and rapid melting of the ice. Other writers add the hypothesis of electrical movements, of volcanic upheavals, occurring in the ocean-bed.

It is probable, however, that the bottom of the Sea and the great mass of its waters are tolerably tranquil. Otherwise Ocean would be unfitted to discharge its great function as the mother and nurse of living beings. Maury somewhere calls it a vast *nursery*. A world of delicate organisms, far frailer than those of earth, are cradled and suckled in its waters: a fact which affords us a very pleasing conception of its interior, and leads us to believe that its violent agitations are not of general occurrence.

* Maury, "Physical Geography of the Sea."

In its nature it is ordinarily regular, and subject to certain grand uniform and periodical movements. Storms are transitory outbursts caused by the winds, the electric forces, or certain violent crises of evaporation. They are accidents occurring only on the surface, which in no degree reveals the true and mysterious personality of the Sea.

It would be absurd to judge of a human temperament by isolated attacks of fever. How much more absurd to judge of the Ocean by its fugitive and superficial convulsions, which do not affect it beyond a few hundred feet in depth!

Wherever the Sea has depth its life continues in equilibrium, or perfectly balanced, calm and fertile, incessantly occupied in its creative work. It knows nothing of those trivial accidents which only disturb its upper strata. The innumerable legions of its children which live in the bosom of its peaceful darkness, and ascend but once a year, at the utmost, towards the Light and the Storm, should love their mighty nurse as Harmony itself.

However this may be, these accidents too intimately concern the life of man not to stimulate him to the utmost watchfulness of observation. The task is not an easy one. He cannot preserve his composure. The soberest descriptions abound in vague, general traits, which do not bring out the originality of every tempest, that individuality which is the unforeseen result of a thousand obscure and undistinguishable circumstances. The observer who watches the storm from a safe position on shore can undoubtedly contemplate it more satisfactorily, because he is not occupied with his own danger. But can he judge of it as a whole as well as he who is involved in the centre of the whirlwind, and who enjoys on all sides the terrible panorama?

We landsmen owe it to our mariners to accredit the facts which they attest, and their stories of what they have seen

and suffered. The sceptical levity with which our fireside philosophers receive the information supplied by seamen, on such subjects, for instance, as the height of the waves, seems to me in very bad taste. They sneer at those navigators who estimate it at a hundred feet. Certain engineers have believed in their ability to measure the tempest, and to calculate precisely that the water never rises more than three or four fathoms. A trustworthy observer assures us, on the other hand, that, from the shore, and in security, he has plainly seen gathering masses of waves rising to a loftier elevation than the towers of Notre Dâme or Montmartre itself.

It is very evident that the disputants are speaking of wholly different things, and hence their apparent contradiction. If we refer to what we may call *the field of the tempest*, its lower bed—if we speak of the long, rolling waves which maintain in their fury a certain regularity of line, the estimate of the engineers is correct. With their rounded crests and deep valleys alternately coming into sight they preserve an average elevation of from twenty to twenty-five feet. But those billows which hurtle and dash against one another, and which never blend into any distinct whole, rise to far loftier altitudes. They gain from their collision the most prodigious powers of ascension, spring upwards, and fall again with an incredible heaviness, to overwhelm, engulf, and shatter the storm-tossed vessel. Nothing is so heavy as sea-water. Those awful headlong descending billows of which mariners tell us, are the outbursts of the contending Ocean, and phenomena whose real grandeur it is impossible to calculate.

One day—a day not of storm but of subdued emotion—when Ocean was preluding with some wild snatches of gaiety, I was tranquilly seated on a noble headland, about eighty feet above the sea-level. I amused myself by watching the curl of a green wave, as, stretching over a line of two thousand yards, it broke against my rock, and hurried to the assault.

It struck gallantly; the promontory reeled before its blows; thunder resounded under my feet. But this regularity suddenly ceased. Some western billow dashed violently across my grand orderly wave, which came up from the south. In the conflict the sun was all at once obscured; on my lofty promontory prevailed not a rainbowed vapour of light spray, but rather a dense black wave, which swelled and sank, and enveloped and bathed me, until I was thoroughly flooded. I should have liked Messieurs the Academicians and Messieurs the Engineers, who measure so exactly the contents of the Ocean, to have been at my side!

It is not for us, when comfortably seated in our closets, to throw suspicion lightly on the veracity of so many intrepid men, hardy, self-reliant, and patient, who have confronted death too frequently to indulge the puerile vanity of exaggerating their dangers. Nor should we oppose the uneventful narratives of ordinary navigators, who follow the well-known leading ocean-routes, to the pictures, occasionally somewhat emotional, of those audacious discoverers who have been the first to visit and describe the reef and the shoal, carefully investigating and approaching the peril, which the common seaman, the regular plodder of Ocean, is ever anxious to avoid. The Cooks, the Pérouses, the D'Urvilles, and other pioneers, incurred actual dangers in the then unfrequented waters of the Coral and Australian Seas; compelled to coast along banks which incessantly shift their positions, and to plunge into opposing currents which cross and check one another, and in the narrow straits produce the most frightful commotions.

"Though there was no storm, the mere heaving of the Sea, with the wind right behind us, dealt our ship such violent blows on her broadside that the bell began to ring of its own impulse; and had these great rollers lasted, their sideward

movement must have shaken, loosened, and demolished our vessel."

"Off the Aguilhas bank," says D'Urville, in another place, "the waves were eighty and a hundred feet in height. I have never seen elsewhere so monstrous a sea. Happily they unfurled upon us only their crests, or the corvette must have been ingulfed. During the terrible encounter she remained motionless, not knowing what to understand. The sailors on deck were sometimes submerged. This frightful chaos lasted fully four hours of the night—an age to make one's hair turn gray!.....Such are the southern tempests; and so terrible are they, that the inhabitants of the neighbouring shores, when they foresee their approach, are immediately smitten with alarm, and retire for safety to their caverns."

But accurate and interesting as these descriptions may be, I do not care to copy them. Still less can I venture to imagine and arrange in order things which I have not seen. I shall say but a word or two in reference to some storms which I have myself witnessed, and which have enabled me, I believe, to seize the different characteristics of the Ocean and the Mediterranean.

During half a year spent at Nervi, two leagues from Genoa, on the shore of the most beautiful and most sheltered sea in the world, I was a spectator of only one inconsiderable gale, which did not last long, but, while it lasted, raged with singular fury. Unable to see it clearly from my window, I issued forth, and through narrow streets and between rows of lofty palaces, ventured to descend, not upon the shore—there is none—but on a ledge of black volcanic rocks that skirts the beach—a narrow pathway, in many places not three feet wide —which, rising and sinking, and frequently overhanging the sea, dominates it about thirty feet, sometimes forty or sixty. It was impossible to discern objects at any distance. The

scene was shrouded by continual whirls of mist. You could distinguish but little; that little was limited and frightful. The roughness, the brittle angles of the shingly coast, its points and peaks, its abrupt bends, compelled the tempest to perform a succession of violent leaps and sallies, of incredible efforts, of infernal tortures. It gnashed with a white foam, and, so to speak, with muttered curses, at the ferocity of the waves which pitilessly assailed it. Then came absurd and insensate noises, which nothing followed; discordant thunders, and sharp whistlings, like those of a steam-engine, at which one shut one's ears. Stunned by a spectacle which dazed every sense, I attempted to recover myself, and resting against a wall which interposed between me and the raging blast, I began to enter into the tumult. Rude and narrow was the flood, and the frenzy of the combat chiefly confined to that strange coast, so curiously cleft and broken—to those cruel angles which, starting up in the tempest, rent the billows. The upper ledge gave way at various points, and sank into the thunderous depths.

The eye was offended as well as the ear by the diabolical contrast of blinding snow lashed from jet-black waves.

As a whole, I felt that in a limited sea the storm is far less terrible than on earth. But it is the contrary case with the Ocean.

THE SEA BEATING ON A ROCKY SHORE.

reply to the subject I had treated in 1859—a subject both delicate and grave. The place and the book blend agreeably in my recollections. Could I have written it elsewhere? I know not. But of this I am certain, that the wild fragrance of the country, its severe simplicity, the vivifying pungency of the odours which load its heaths—the flora of the landes, the flora of the dunes—did much for my work, and may be plainly traced in its pages.

The inhabitants were well adapted to the nature of the scenery. There was no vulgarity in them, no grossness. The agricultural portion are characterized by a grave demeanour and great seriousness of manner. The marine are pilots, and belong to a small Protestant colony, which has escaped the persecutions of the past. A primitive honesty prevails—neither lock nor bolt is known in the village. There is no clamour. You find a modesty uncommon among seafaring men, a discretion and a tact not always found in the higher classes. Constantly mingling with, and much esteemed by them, I nevertheless enjoyed the solitude which my labours required. And, therefore, I interested myself the more deeply in these men and in their hazards. Without speaking to them, I daily followed them with my prayers in their heroic occupation. The weather disturbed me, and frequently, when watching the dangerous channel, I asked myself whether the sea, for its long-continued mildness and beauty, would not exact a cruel compensation.

This perilous place is by no means gloomy. Every morning from my window I gazed upon the white sails, lightly touched with rose-tints by the Morning, of a crowd of merchant ships waiting for a favourable breeze. The Gironde at this point is not less than three leagues broad, and combines with the sublimity of the great American rivers the liveliness of Bordeaux. Royan is a pleasure resort for visitors from all parts of Gascony. Its bay, and that of Saint-George's, are

gratuitously entertained with the frolics of the porpoises, which they indulge in the open river, and even in the midst of the bathers. They bound and leap in the air to a height of five or six feet. It seems they are fully aware that in France no porpoise fishing is attempted; that on this great battle-field, where every hour man devotes his energies to piloting and saving vessels, he never thinks of coveting the oil of a porpoise.

Add to the lively aspect of the river, the rich and unique harmony of its two shores. The fertile vineyards of Médoc confront the harvests of Saintonge and all its varied cultivation. The sky does not wear the settled and the occasionally almost monotonous beauty of the Mediterranean: it is full of change. From the sea-waters and the fresh-waters soars a multitude of iridescent clouds, which project strange hues of emerald, rose, and violet on the mirror whence they have sprung. Fantastic creations—which one sees only for a moment to regret their loss—decorate with grotesque monuments, and bold arcades, and lofty bridges, sometimes with triumphal arches, the portal of Ocean.

The two semicircular shores of Royan and Saint-George's, and their fine sands, furnish delicate feet with a delightful promenade, which they may prolong without weariness into the shade of the pine-trees that cover the dune with their young verdure. The beautiful promontories that separate these shores, and the landes of the interior, greet you, even at a distance, with healthful emanations. The air which breathes over the dunes is somewhat medicinal in its properties: 'tis rich with the honied odour of the *immortelles*, in which all the rays of the sun and all the warmth of the sands seem to concentrate. Keen pungent perfumes prevail on the heathery landes, with a penetrating charm which re-awakens the brain and revives the heart. Here are the thyme, and the wild thyme, and the amorous marjoram, and sage which our fore-

fathers blessed for its many virtues. The peppermint, and especially the little wild pink, are endowed with a subtler fragrance than the spices of the Orient.

It seemed to me that on these landes the birds sang more sweetly than elsewhere. I have never met with any lark to equal the songstress whose melody greeted me in July on the promontory of Vallière. She rose in the spirit of the flowers—rose golden with the sun, which was then sinking into the Ocean. The voice, though it came from such a height—not less, perhaps, than a thousand feet—was as soft and modest as it was powerful. She warbled to her nest in the lowly furrow—to her fledglings, which wistfully watched her—her sublime song of the plains: one might have said that its harmony interpreted the light of the glorious sun, the splendour among which she hovered—encouraging them, and saying, "Rise, rise, my little ones!"

All these circumstances—these songs and perfumes, this genial air, and that Sea softened by the waters of the beautiful river—composed an infinitely agreeable accordance, yet an accordance without any remarkable brilliancy of effect. The moon seemed to me luminous, without too strong a brightness; the stars very distant, yet not too scintillating. The climate was bland, gentle, and would have been voluptuous if there had not mingled with it an indefinable something which induces reflection, dispels reverie, and compels thought.

And what? Is it these moving sands, these changing dunes, the crumbling fossiliferous limestones, which warn us of the universal mutability? Is it the silent but ineffaceable recollection of Protestant persecutions? It is these; but it is far more the solemnity of the Channel, the frequency of the wrecks, the immediate neighbourhood of a terrible sea, which gives a gloom to the inland landscape.

A great mystery transpires at this solemn scene: a treaty,

a marriage, and one of infinitely more importance than any royal nuptials. A marriage—not of love, it is true—but between two ill-assorted parties. The lady of the South-Western waters, supported by the Tarn and the Dordogne, impetuously urged forward by her violent brothers, the Pyrenéan torrents,—she comes, this gracious and sovereign Gironde, to offer herself to her giant bridegroom, the aged Ocean. But where is he harsher or more crabbed? The melancholy barrier of the Charente swamps—then that long line of sands which frets it for some fifty leagues—keep him in a sullen mood. When he does not accumulate his fury against Bayonne and St. Jean-de-Luz, he vents it on the poor Gironde. She does not go forth, like the Seine, sheltered on every side: she falls full in the face of the boundless Ocean. Very frequently he drives her back. She recoils; she flies to the right, to the left. She hides herself in the marshes of Saintonge and under the vines of Médoc; communicating to its wines those cold and sober properties which are distinctive of its waters.

Now, imagine men hardy enough to fling themselves, at the height of the contention, between the bridegroom and his bride; and in a little boat, confronting the blows which these aim at one another, to seek the fearful vessel which waits off the river-mouth, and dares not venture in. This is the life of my pilots—a life modest, but so glorious, when one shall know how to relate its story!

You may easily understand that the old King of Wrecks, the ancient keeper of so much submerged treasure, bears no good-will to the rash intruders who dispute with him his prey. And if he sometimes lets them escape him, often he will be in wait for them with malicious cunning, to take his revenge, rejoicing more in drowning one poor pilot than in swallowing a couple of vessels.

Seasons, however, will now and then occur which no sad

accident distinguishes. The very hot summer of 1859 recorded no misadventures in this quarter except a barque wrecked in the month of June. But a certain indescribable agitation made one prescient of misfortunes. September came, and October. The brilliant world of visitors, who seek of the Sea its smiles alone, had already passed into eclipse. I remained, attached to the spot by my unfinished work, and also by the strange charm of these intermediate seasons.

We remarked that the winds were changeable, fantastic, and could not be predicted; for instance, a burning wind blew from the east, a strong gust coming from an always serene quarter. The nights were sometimes warm, and warmer in September than in August — sleepless, disturbed, agitated: the pulse was strong, excited without any apparent cause; and one's mood unequal.

We were seated one day on the piny slopes, which are swept by the wind, though slightly protected by the line of dunes, when we heard a young and singularly clear and penetrating voice, with a fine robust, metallic tone. It was that of a very young and very little girl, with a reserved countenance. She passed by with her mother, singing at the top of her voice the words of an old ballad. We begged them to be seated, and to sing to us the entire song.

It proved to be a little rustic poem, wonderfully breathing the two-fold spirit of the country. Saintonge is agricultural, and loves the home-tree. It has no bold Basques, with their keen thirst for adventures. Yet, in spite of its sedentary tastes, it adopts a maritime life, and plunges into all its perils. Why? The legend explains :—

The charming daughter of a king, who amuses herself with washing her linen, like the Nausicaa of the Odyssey, drops her ring in the Sea. A son of the coast springs in after it, but is drowned. She weeps; and is changed into the rosemary of the shore, so bitter but so fragrant.

This ballad of disaster, chanted at so critical a time in the forest heavily groaning with the imminent storm, affected and enchanted me, while confirming my inward presentiments.

Each time that I visited Royan, I expected—though the journey lasts but a few hours—the storm would surprise me *en route*, and without shelter. It weighed upon me in the vineyards of Saint-George's, and the moorland of the promontory which I first ascended. It weighed, and still more heavily, in the great circular shore of Royan which I afterwards skirted. The moor, though it was in the month of October, breathed all its wild odours, and at some moments they seemed more penetrating than I had ever before known them. Along the still tranquil beach the warm, bland wind blew in my face; and, not less bland, the Sea, suspiciously caressing, came to kiss my feet. But I would not be beguiled, and mistrusted much what the two traitors were brooding.

By way of prelude, after a succession of very lovely evenings, some awful gales burst forth at night. These returned several times, and especially on the 26th. That night I felt assured some great disaster would befall. Our mariners were out at sea. In the prolonged fluctuations of the equinoctial crisis, at first they wait a little; then, the calm becoming protracted, duty and professional spirit incite them to action: they sail forth and hazard everything, at the risk of a sudden outburst. I had a strong impression that one would then occur. I said to myself, "Somebody will perish!"

It proved only too true.

From a pilot's boat which ventured out, in spite of the stormy weather, to extricate a ship from the danger of the channel, a poor wretch was washed away, and the boat, which nearly perished, was unable to pick him up. He left three

children, and his wife pregnant with another. And what made the catastrophe still more to be regretted was, that the noble fellow, with a generous love not uncommon among seamen, had married a poor girl incapable of work, having accidentally lost several joints of her fingers. Terrible situation!—she is infirm, pregnant, and widowed!

A collection was made on her behalf, and I carried to Royan my little offering. A pilot whom I met spoke of the event with sincere sorrow. "Such is our trade, sir," said he; "and it is when the Sea is at its roughest that we must venture out." The commissary of marine, who keeps the registers of the living and the dead, and knows better than any one the future lot of their families, appeared to me anxious and melancholy. It could easily be seen that this calamity was only a beginning.

I took the route along the shore; and had leisure, in a tolerably long journey, to observe and study a zone of clouds which I think might have extended in all directions some eight to ten leagues. On my left, Saintonge—whose coast I followed—waited in a dull and passive expectancy. On my right, Médoc—from which the river separated me—was wrapped in a sombre calm. Behind me, and coming from the west, rose a world of black clouds. But in my face, and blowing from Bordeaux, a land-wind darted against them. This wind descended the Gironde; and one might almost have hoped that the mighty river, with the aid of this grand protecting current, would have driven back the gloomy curtain which Ocean raised.

Still uncertain as to the meaning of these signs, I turned to the rear, and consulted Cordouan. Situated on its rock, it seemed to me clothed in a fantastic paleness. Its tower glimmered like a phantom, and said, "Woe! woe!"

I began to comprehend my situation. I saw very clearly

that the land-wind would not only be vanquished, but would be converted into an ally of its enemy. This land-wind hung very low over the Gironde, beat down every inferior obstacle, and levelled a pathway for the high and sombre clouds which came in from the Ocean—laying down for them, as it were, a smooth plane, once mounted upon whose surface they travelled with much greater speed. Very soon all was finished on the side of the land—every breath was hushed—Nature seemed enveloped in one dull leaden hue — and the higher winds reigned uncontrolled.

When I arrived in the vineyards of Vallière, near Saint-George's, I found many persons in the fields, hastily completing the tasks in which they were engaged, and conscious that a long interval of enforced idleness was before them. The first rain-drops fell, and warned us to seek immediate shelter.

I had seen many storms; I had read a thousand descriptions of tempests; and I was prepared for a scene of savage grandeur. But I had not anticipated the effect this gale would produce by its protracted duration, its sustained violence, its implacable uniformity. When it rages or sinks—in a brief pause, or even a crescendo, in fact in any variation—the soul and the senses find a certain relaxation or distraction which responds to their imperious need of change. But here, for five days and nights, there was neither truce, nor augmentation, nor diminution; it continued uniformly furious and monotonously horrible. There was no thunder—no wild collision of opposing clouds—no breaking up of the Sea. At first a great grayish canopy overhung the entire horizon: you found yourself buried in this ashen-gray and gloomy shroud, which did not shut out every gleam of light, but allowed you to look upon an expanse of lead, hateful and desolating in its furious monotony. It knew but one note: ever prevailed the one howling sound, as of a vast seething caldron. No poetry of

terror could have had the effect of this prose. Always, always the same sound—*Heu! heu! heu!* or, *Uh! uh! uh!*

We dwelt upon the shore, and were consequently more than spectators of the scene—we were actors in it. At times the Sea bounded twenty paces forward. At every blow our house trembled. A raging south-wester dashed against our windows—though fortunately in a somewhat aslant direction—a torrent; nay, not a torrent, but a deluge—Ocean upheaved in rain. On the first day, in great haste and not without much difficulty, we closed the shutters and had to light our candles, though it was broad daylight. Even in the rooms which faced inland, the tumult and commotion were equally perceptible. I persisted in my work, curious to see whether this savage force could succeed in oppressing and enthralling a free spirit. I maintained the full activity of my mind, and its supremacy over itself. I wrote, and I observed. It was not until after some time that fatigue and want of sleep weakened in me the most delicate faculty which I think a writer can possess—the feeling for rhythm. My phrases became inharmonious. This chord was the first shattered in the instrument.

The howling monotony of Ocean was relieved only by the strange, fantastic voices of the implacable wind. Our house was an obstacle to its progress, and a goal which it assailed in a hundred different ways. Sometimes it was an abrupt, masterly stroke levelled at our gate. Then the shutters rattled as if shaken by a strong hand. Shrill complaints were whistled down the chimney: regrets that it was not allowed to enter; threats if we did not give it admission; followed by bursts of passion and terrifying attempts to carry off the roof. Yet all these attempts were overawed by the grand *Heu! heu!*—so vast, so powerful, so awesome was this latter sound! The wind seemed but secondary to it. Nevertheless it contrived to gain an opening for the rain. Our house—I was going

to say our ship—leaked, and the loft, giving way in several places, was soon flooded.

Things became very serious. The furious hurricane contrived, by a desperate effort, to loosen the hinge of a shutter, which thenceforth, though still closed, shook, and trembled, and creaked. We found it needful to secure it by strongly fastening its ironwork to one which had more successfully withstood the storm; and for this purpose we ventured to open the window. When I opened it, although protected by the shutters, I felt myself seized as by a whirlwind—half-deafened by the horrible roar of a sound like artillery, like that of a cannon incessantly discharged full in my ear. Through the crevices I caught sight of a circumstance which afforded some idea of these incalculable forces—namely, that the waves, crossing and broken against each other, were frequently unable to regain their level. The squall lifted them like a feather, these heavy masses, and scattered them over the country. What would have happened if, carrying away our shutters and beating in the window, the wind had poured in upon us the great waves which it supported and propelled with all the density of a waterspout, and swept across the plains in a track of desolation?

We nearly incurred the fantastic chance of being shipwrecked on the land. The roof, or perhaps an entire story, of our house, which stood far out upon the shore, might have been carried away. This fear disturbed our villagers, as they told us, every night. They advised us to abandon it. But as we cherished the belief that this protracted tempest was always on the point of passing over, we constantly answered, "To-morrow."

The news we received told us of nothing but wrecks. In our immediate vicinity, on the 30th of October, a ship from the South Seas, with a crew of thirty men, perished in the very channel. After having escaped the rocks and the shal-

lows, it drove in front of a small tract of fine sand, where the women bathe; and lifted by the whirlwind—undoubtedly to a great elevation—it fell back upon this delightful sandy beach with a terrible crash, shattered, dislocated, and with her back broken. She lay there like a dead body. What became of her crew? No trace of them was discovered, and it was supposed the billows had swept them from the deck.

This tragic event led us to believe that many others had occurred; and we dreamed only of misfortunes. Yet the Sea did not seem satisfied with its prey. All the world had had enough; but not *it*. I saw our pilots venture behind a wall which covered them from the south-west, look anxiously at the vexed Ocean, and shake their heads. Happily for them, no vessel attempted to enter the Gironde, and demand their assistance. But they were there, and ready to devote their lives.

I, too, contemplated that Sea incessantly, eying it with a feeling of hatred. Being in no actual danger, I suffered the more from weariness and regret. It was tedious, that Sea; its countenance frightful. There was nothing in it to remind me of the empty pictures of the poets. Only, by a strange contrast, the less I felt in myself the power of life, the more living seemed that abhorrent Deep. Its waves, electrified by its impetuous movements, had gained the animation of a fantastic soul. In the general madness, each billow had its particular mania. In the uniformity of the vast whole—the thing is true, though apparently a contradiction—an infernal fermentation prevailed. Was this the delusion of my eyes—of my fatigued brain? Or was it really the case? They gave me the idea of a frightful *mob*, of a horrible populace—not of men, but of howling dogs; a million, tens of millions, of desperate sleuth-hounds, or rather madmen. But what do I say? Dogs, sleuth-hounds? Nay, something worse than

these. They were accursed and nameless apparitions—beasts eyeless and earless, with only foaming jaws.

Monsters, what would ye have? Are ye not glutted with the wrecks which I hear of on every side? What do ye demand? "Thy death, and universal death, the annihilation of earth, and the return of chaos!"

CHAPTER VIII.

THE LIGHTHOUSE.

IMPETUOUSLY rages the Channel, through the narrow defile which ingulfs the rushing waters of the North. Violent is the Sea of Brittany in the boiling eddies of its basaltic recesses. But the Gulf of Gascony, from Cordouan to Biarritz, is a thing of contradictions, an enigma of combats. As it extends southward, it suddenly attains an extraordinary depth, an abyss which swallows up the waves. An ingenious naturalist has likened it to a colossal funnel, which absorbs with abrupt haste. The tide, escaping there under an awful pressure, towers up in lofty masses, of which our waters afford no other example.

The swell from the north-west is the motive power of the machine. If it is a little more northerly, it pours into the bottom of the gulf, as if it would annihilate St. Jean-de-Luz. If it inclines more to the west, it drives back the current of the Gironde, and with horrible billows caps the unfortunate Cordouan.

Too little is known of this reverend personage, this martyr of the Seas. It is, I believe, the most venerable of all the European lighthouses: only one can dispute with it the honour of antiquity—the celebrated Lantern of Genoa. But the difference between them is important. The latter forms the crown or capital of a fort, and, calmly seated on the solid

rock, can afford to smile at the tempest. Cordouan stands on a reef which is never dry. Great, indeed, was the audacity which ventured to raise it in the midst of the waves, in the violent flood, in the everlasting battle between such a river and such a sea.

Every moment the Ocean strikes it with trenchant lashes, or with heavy blows like the shock of a cannon. An eternal warfare is waged against it. Ever and anon the Gironde, urged by the land-breeze and the Pyrenéan torrents, assails this warder of the channel, as if he were responsible for the obstacles which the outer Sea opposes to its progress.

It is, nevertheless, the sole light of these dangerous waters. He who misses Cordouan, when driving before a northerly gale, has good cause to tremble : he may also miss Arcachon. This Sea is not only the most terrible, but the most obscure. By night it offers no beacon to guide the seaman, no landmark by which he may retrace his course.

During our six months' residence in this vicinity, our ordinary object of contemplation—I may say almost our habitual companion—was Cordouan. We recognized that its position as Guardian of the Seas, as the constant Watcher of the Straits, endowed it with personality. Erect against the horizon of the west, it appeared under a hundred varied aspects. Sometimes, in a zone of splendour, it triumphed under the sun ; sometimes, wan and indistinct, it floated in the mist without any augury of good. At evening, when it abruptly kindled its red light, and darted afar its fiery glance, it seemed a zealous custodian, surveying the waters with a mind anxious and perturbed by its sense of responsibility. Whatever occurred out at sea, one immediately attributed to it. By lighting up the tempest, it frequently saved life ; yet we blamed it as the cause. It is thus that ignorance too frequently treats genius, accusing it of the evils which it does but reveal. We ourselves were not always just. If it were late in displaying its

beams, or if foul weather came on, we reproached it, we chided it:—"Ah, Cordouan, Cordouan, thou white spectre of the waters! knowest thou not that thou bringest us nought but storms?"

Yet it was Cordouan which, in the October gales, saved for us thirty lives. The vessel was dashed to atoms, but the crew escaped.

It is a great gain to see all the circumstances of one's mishap, to be cast ashore in open daylight, and to know the locality, the chances, and the resources which one possesses. "Great Heaven, if we must perish, let us perish by day!"

When the vessel, driven towards land by the furious swell, made our shore at night, it was a thousand chances to one that she had not entered the Gironde. To the right, the luminous headland of Grave warned her to avoid Médoc; to the left, the small lighthouse of St. Palais showed the dangerous rock of the Grand Caute on the side of Saintonge. Between these white and fixed fires flashed on the central reef the red lightning of Cordouan, revealing the channel at intervals of a minute.

By a desperate effort she effected the passage; but this was all. Wind, and wave, and current overwhelmed her at St. Palais. The helpful trinity of the three lights there reverberated: the thirty saw where they were—that they were fast drifting on the sands, and that their only chance of safety was to abandon their vessel. They held themselves ready to start, trusting to the hurricane, to the very fury of the wind. And, in fact, it treated them just as it treats the waves which it carries inland without permitting them to return. Stunned and bruised, they were cast ashore: how I know not, but at least they were alive.

Who can tell how many lives and how many ships are

saved by the lighthouses? Not only does their radiance, when beheld in the awful tumult of tempestuous nights which disturbs even the most intrepid—not only does it point out the path, but it sustains the courageous soul, and prevents the spirit from giving way. It is a great moral support which, in the hour of supreme peril, exclaims:—"Strive! strive! one effort more! The wind and the Sea may be against you; but you are not alone. Humanity yonder watches over you."

The ancients, who in their voyages closely hugged the shore and never lost sight of it, had even more need than ourselves to light up its dangerous places. The Etruscans, it is said, began by maintaining watch-fires on the sacred stones. Their pharos was an altar and a temple, a column and a tower. The Celts followed their example; some very important *dôlmens* are extant, situated exactly at the most favourable points for the full display of their fires. The Romans illuminated the entire circuit of the Mediterranean, from promontory to promontory.

The great terror of the Northern pirates, the trembling life of the sombre Middle Age, was the extinction of these lights. Peaceful men had to take care lest they assisted the rover in his descent. For to the inland dwellers the Sea was an object of dread. Every vessel was an enemy, and, if wrecked, a prey. The plunder of the castaway was the revenue of the seigneur; his was the noble "right of wreckage" (*droit de bris*). We know how a certain Comte de Leon grew rich through yonder rock:—"A precious stone," said he, "of greater value than those which men admire in the crowns of kings."

In our own time, fishermen have often been the innocent cause of shipwrecks by kindling fires upon the shore, which are visible out at sea. Even the lighthouses, by being mistaken one for another, have led to many disasters.

It was France who, after her great wars, took the initiative

in the new arts of illumination, and in their application to the rescue of human life. Armed with Fresnel's light—a lamp with four thousandfold power, visible at twelve leagues distant—she completed a girdle of potent flames which intercrossed their rays, and blended them with one another. Darkness disappeared from the face of our seas.

For the seaman who guides his course by the constellations, it was, as it were, another starry firmament which she created. She called into existence both planets, fixed stars, and satellites, and introduced into these new orbs shades and characters differing from those of the sidereal world. She varied the colour, the duration, and the intensity of the scintillation. To some she gave a tranquil lustre, which sufficed for serene nights; to others, a shifting, revolving radiance, a glance of fire which penetrated to the four quarters of the horizon. The latter, like those mysterious animals which illuminate the Sea, possess the living palpitation of a flame which broadens and waves, swells and dies. In the dark nights of storm they veer and change, they seem to take part in the convulsions of Ocean, and without any sign of wonder, return volley for volley to the lightnings of heaven.

It should be remembered that at the epoch I have been writing of, and also in 1830, the sea was shrouded in darkness. Europe could boast of but few lighthouses. The only one in Africa was at the Cape. There were none in Asia but at Calcutta, Madras, and Bombay. None throughout the enormous extent of the South American coast. But since then all nations have followed and imitated France.* Little by little the light has spread.

I wish I could here perform with you in one night the

* [M. Michelet's national vanity leads him to ignore the important part which Great Britain took in this good work. It is not true that France led the way. She did not act until Great Britain had already accomplished much to reduce the seaman's perils.—*Transl.*]

circumnavigation of our coast, from Dunkirk to Biarritz, and the survey of the great lighthouses. But it would occupy us too long.

Calais, with its four lights of different colours, visible even at Dover, makes hospitable signs to England, and to the world which passes through the English waters. The noble estuary of the Seine, between La Hève and Barfleur, illuminated by friendly pharoses, throws open Havre to America, and receives her direct to the heart and centre of France.

She, too, advances out to Sea to gather in her fleets, illuminating with laudable care all the headlands of Brittany. At the advanced guard of Brest, at St. Matthieu, at Penmark, at the Isle of Sen, all are crowned with fires—each differing in minute or second-flashes—which say to the seaman: "Beware! Observe this rock!.....Shun yonder shoal!.....Here turn aside!.....Good, thou art now in port!"

Remark that all these towers, erected in perilous localities, and frequently reared among the breakers and in the tempests, have successfully solved the problem of absolute solidity. Many are built of immense elevation. Medieval architecture, of which so much is said in praise, never ventured to soar to such a height unless the structure was strengthened by external supports, such as buttresses and flying arches; and towards the summit of the tower, it no longer trusted to masonry, but invoked the inartistic assistance of iron cramps, which held the stones together. These processes may be easily studied in Strasburg spire. Our constructors despise them. The lighthouse of Héaux, recently built by M. Reynaud on the dangerous reef of the Epées de Tréguier, has the sublime simplicity of a gigantic ocean-plant. It meddles not with buttresses. Into the live rock it sinks deep its hewn foundations. On a base sixty feet broad it rears a column twenty-four feet in diameter. Its large blocks of granite are fitted

into one another. More, in the lower part, the layers are bound together by dodos, also of granite, which simultaneously penetrate into the superimposed stones. The whole is so exactly hewn and shaped that cement is superfluous. From base to summit, every stone biting thus into its neighbour, the lighthouse is but one sole block, more one than the very rock it stands upon. The billows know not where to assail it. They smite, they rage, they glide. But after all its thunderous shocks the utmost that it gains is this,—the lighthouse reels, and slightly bends over. But in this there is nothing to alarm us. A similar undulation will be found in the most ancient and massive towers.

Thus, then, instead of the sombre fortresses which in the old time menaced the sea, like those which I have seen erected against the tribes of Barbary, modern civilization raises towers of peace and benevolent hospitality. Glorious and noble monuments, which are frequently sublime in the eye of art, and always appeal to the compassionate spirit! Their many-coloured fires, wherein mingle the gold and silver of the stars, may be compared to an auxiliary firmament which a human providence has organized upon earth. When not a single planet peers forth, the mariner still sees these, and regains his courage on once more beholding his own star, the star of Brotherhood.

We love to seat ourselves near the pharoses, within reach of those friendly fires, the true home and hearth of maritime life. Not one among them, not even the most modern, but seems already venerable to the men whom it has saved. More than one memory is associated with it; it is surrounded by traditions, and by legends which are not only beautiful but true. Two generations are sufficient to invest them with antiquity, to consecrate them with age. The mother will

often say to her young family,—"Yonder light-tower saved your grandfather, and but for it you had never been born."

How frequently is it visited by the anxious wife, watching and waiting for her husband's return! At eve, ay, and also in the night, you will find her seated at its foot, patiently entreating the helpful light which beams above to bring back the absent one, and lead him into port.

With true justice the ancients were accustomed to honour in each sacred stone the shrine of those gods who are specially the saviours of man. And for the heart which in the fury of the tempest trembles and hopes, the thing has changed not; and in the shadows of the night, she who weeps and prays still beholds in it an altar and a very deity!

BOOK II.

THE GENESIS OF THE SEA.

Roll on, thou deep and dark-blue ocean, roll!
Ten thousand fleets sweep over thee in vain;
Man marks the earth with ruin—his control
Stops with the shore;—upon the watery plain
The wrecks are all thy deed.

BYRON.

BOOK II.

THE GENESIS OF THE SEA.

CHAPTER I.

FECUNDITY.

FIVE minutes after twelve, on St. John's Night—from the 24th to the 25th of June—the great herring fishery begins in the Northern Seas. Phosphorescent gleams are undulating with the dancing motion of the waves. "See the sparkles (*éclairs*) of the herring!" This is the sacred signal understood by every boat. From the depths a living world is mounting to the surface, following the attraction of heat, desire, and light. The lustre, pale and tender, of the moon has a charm for the timid race; it is the reassuring beacon which seems to embolden them for their grand festival of love. They mount; they mount all together; not one loiters in the rear. Sociability is the law of the race; you never see the herring alone. United they live in the enveloping obscurity of the deeps; united they go forth in the spring to enjoy their tiny share of the universal happiness, to see the day, to enjoy, and to die. In serried files, and closely packed, they seem never near enough to one another; they voyage in

compact shoals; "just," say the Flemings, "as if our dunes had put to sea." Between Scotland, Holland, and Norway, you would think an immense island had been upheaved, and that a continent was on the point of emergence. An arm is detached to the eastward, and penetrating into the Sound, fills up the mouth of the Baltic. In certain narrow straits the fisherman is unable to row, for the sea is solid. Millions upon millions, thousands of millions upon thousands of millions—who will venture a guess at the number of these legions? It is recorded that formerly, near Havre, a single fisherman would net in one morning eight hundred thousand fish. In a Scotch seaport, eleven thousand barrels full have been caught in a night.

They come like a blind and fatal element, and no destruction discourages them. Men, fish, all pounce upon them; but still they come, they come! Nor need we be astonished at this; the reason is, that while voyaging they love. The more we kill them, the more they produce and multiply *en route*. The dense, deep columns, moved by a common electricity, float in entire abandonment to the great work of happiness. The whole moves at the impulse of the tides and the electric flood. Take from the mass at haphazard, and you will find them fecund—you will find those who have been, and others who wish to be. In this marine world, ignorant of any permanent union, pleasure is an adventure, love a navigation. Along the entire route, they diffuse torrents of fertility.

For a depth of two or three fathoms, the water disappears in the incredible abundance of the maternal flow in which the spawn of the herring swims. It is a marvellous spectacle, at sunrise, to behold the water white for several leagues with the milky fluid of the male fish.

Dense, fat, and oily waves, where life ferments in the leaven of life. Over hundreds of leagues in length and breadth the Sea is like a volcano of milt, and of

fecundated milt which has made its eruption, and deluged the waves.

Full of life on the surface, the Sea would be overwhelmed if this remarkable reproductive power were not violently opposed by a fierce confederacy of all kinds of destructive agencies. Only bethink you that each herring produces forty, fifty, ay, even seventy thousand eggs! If a violent death brought no remedy, each of these multiplying itself on the average by fifty thousand, and each of these fifty thousand multiplying itself in its turn in the same ratio, they would succeed in a few generations in overwhelming and solidifying the Ocean, or in putrifying it, in suppressing all its races, and converting the globe into a desert. Life imperiously demands here the assistance, the indispensable assistance, of its sister, Death. They therefore engage in a battle, a gigantic struggle which yet is amicable and harmonious, and for the general safety.

In the great universal hunt of the condemned race, those who undertake the task of driving back its masses and preventing their dispersion, those who force them towards the shores, are the giants of the Sea. The whale and the cetacea do not disdain this prey: they pursue it eagerly, plunge into the shoals, penetrate into the living density; their colossal jaws absorb by the ton the unlimited prey which seems to suffer no diminution and continues its flight towards the coast. There takes place another and greater destruction. At first that of the little by the little; the smaller fish swallow the spawn and eggs of the herring, gorge themselves with the milt, swallow up the future. As for the present, the mature herring, Nature has created a gluttonous tribe, which, with wide apart eyes, sees nothing, eats nothing but the best; which is all stomach: the gourmandizing tribe of the *gadidæ*—the whiting, the cod, &c. The whiting gorges and fills itself with herrings, and

grows fat upon them. The cod gorges and fills itself with whitings, and grows fat upon them. So that here again the great danger of the Seas, an excessive fecundity, re-commences, and on a more terrible scale. The cod differs, in truth, from the herring, for it produces nine million eggs! A cod of fifty pounds bears fourteen pounds' weight of spawn—one-third of its own weight! Add that this creature, with its formidable power of maternity, is in love for nine months out of twelve. It is she who imperils, who endangers the world. To the rescue! launch your vessels, equip your fleets! England alone sends twenty or thirty thousand seamen. How many does America send? How many France, Holland, the whole earth? The cod, and the cod alone, has created colonies, built towns, and founded factories. Its preparation is an art; an art with a language, and a technical idiom of its own, peculiar to the cod-fisheries.

But what can man effect? Nature knows that our puny efforts, our fleets, and our fisheries would do nothing for the accomplishment of her object—that the cod would conquer man. Therefore, she does not trust to him. She invokes far more energetic forces of death. From the bottom of the rivers she summons to the deep one of the most active and determined of all voracious eaters, the sturgeon. Having visited the rivers to enjoy its loves in peace, it returns from them hungry and ferocious, and, with a gigantic appetite, throws itself upon the banquet of the Sea. How great a boon for the famished creature is the fat cod which has assimilated to itself whole legions of herrings! How boundless a happiness to find there a concentration of substance, to feast on firm substantial flesh! This valiant eater of cod, though less fertile than its victim, is still sufficiently prolific; it yields fifteen hundred thousand eggs. A sturgeon of fourteen hundred pounds has a hundred pounds' weight of roe, or four hundred and fifty pounds of

eggs. The danger re-presents itself. The herring's terrible fecundity was a menace; so was that of the cod; and so again is that of the sturgeon.

It becomes imperative, then, that Nature should invent a supreme devourer, an admirable eater but a poor producer, of immense digestion and sparing generation: a helpful and terrible monster which shall check this unconquerable tribe of reproductive fecundity by a grand effort of absorption, shall indifferently swallow every species—the dead, the living—yea, all that it encounters. The "grand eater" of Nature, its patent eater, is the shark.

Now, these terrible destroyers are conquered beforehand. However furious their appetite, they do but sparely reproduce their kind. The sturgeon, as we have seen, is less fertile than the cod; and the shark is barren, compared with other fishes. It does not pour itself, as they do, in torrents over the entire Ocean. A viviparous animal, it elaborates in its bosom the infant shark, its legitimate heir, and gives birth to it in full armour and all its terrors.

In its fecund shades, the Sea may well smile at the destroyers which it cherishes, in the full assurance of begetting a more plentiful life. Its principal wealth defies all the rage of these devouring beings, and is inaccessible to their attacks. I speak of the infinite world of living atomies, of microscopic animalcules, a veritable abyss of life ever fermenting in its bosom.

It has been said that the absence of the solar light would exclude all life, and yet in the lowest depths the soil is strewn with sea-stars (*asteria*). The waves teem with infusoria and microscopic worms. Innumerable molluscs there trail their shells. Bronze-hued crabs, beaming actiniæ, snowy porcellanas, gilded cyclostomas, undulated volutas, all live and move in the depths. There, too, swarm the luminous animalcules, which,

occasionally attracted to the surface, shine like trains and serpents of fire—like sparkling garlands. The Sea, in its transparent density, owes to them, here and there, a fortuitous illumination. It has of itself a certain splendour—a certain indescribable half-light, which is noticeable in fish both dead and alive. It is its own illumination, its own radiance—its heaven, its moon, and its stars.

Any one may observe in our salterns the prolificness of the Sea. The waters concentrated in them leave violet-coloured deposits which are wholly composed of infusoria. All navigators concur in stating that over a tract of tolerable extent they have traversed only living waters. Fregunit saw sixty millions of square yards covered with a bright scarlet, which was nothing more than an animal plant, of such minuteness that every square yard contained forty millions. In the Bay of Bengal, in 1854, Captain Kingman sailed for forty miles across an enormous white expanse which gave the Sea the appearance of a snowy plain. There was not a cloud on the sky, whose dull, leaden hue contrasted with the gleaming Sea. When closely examined, this white water was ascertained to be a jelly, and by means of a microscope, a mass of animalcules could be detected, whose movements produced the most fantastic luminous effects.

Péron similarly records that he sailed for twenty leagues through a kind of gray dust, which, examined with the microscope, proved to be a stratum of eggs of unknown species, covering and concealing the waters over this immense area.

On the desolate shores of Greenland, where man dreams that all nature is dead, the Sea is densely peopled. You may traverse a space, two hundred miles long by fifteen broad, of waters of a dark brown colour, which receive this tint from a microscopic medusa. Each cubic foot of this water contains,

according to Schleiden, more than one hundred and ten thousand.

These nourishing waters teem with all kinds of fat atoms, appropriate to the tender nature of the fish, which lazily open their mouths and suck them in, nourished like an embryo at the bosom of the common mother. Do they know what they swallow? Scarcely. This microscopic food is like milk spontaneously poured out for them. The great fatality of the world, Hunger, belongs only to the land; here it is anticipated and ignored. No exertion is necessary—no pursuit of sustenance. Life flows by like a dream. In what shall consist the entity of its force? All outlay of it is impossible. It is reserved for love.

The real travail and labour of this great world of the Seas is, to love and multiply. Love fills up its prolific night. It descends into the depths, and seems richest among the infinitely minute. But what is truly the atom? When you think you have reached the lowest stage, the indivisible unit, you discover that this, too, loves, and divides its existence to draw from it another being. At the lowest degrees of life, where every other organism fails, you find in complete development all the reproductive organs.

Such is the Sea. Apparently, it is the great female of the globe, whose indefatigable desire, permanent conception, and prolific birth never cease.

CHAPTER II.

THE MILKY SEA.

SEA-WATER, even the purest, when procured in the open ocean, free from all admixture of earth, is of a whitish colour, and somewhat viscous. Held between the fingers it unwinds, or reels of, as it were, and passes through them slowly. Chemical analyses do not explain this characteristic. It originates in an organic substance, which in attaining they destroy, depriving it of its specialty, and reducing it violently to general elements.

The ocean plants and animals are clothed with this substance, whose mucosity, consolidated around them, has a gelatinous effect, sometimes fixed and sometimes wavering. They appear through it as through a diaphanous veil. And nothing contributes more powerfully to the fantastic illusions which the world of the Seas produces. The reflections are so singular, oftentimes most strangely iridiscent, on the scales of fish, for example, or on the molluscs, which seem to derive from it all the gorgeousness of their pearled shells.

This it is which most vividly impresses a child when for the first time he sees a fish. I was very young when this event in my life occurred, but I can perfectly recollect the keen impression produced. That shining, slippery creature, with its scales of silver, threw me into an indescribable state of astonishment and rapture. I attempted to seize it, but found it as difficult

to hold as the water which escaped from my little fingers. It appeared to me identical with the element in which it swam. I had a confused idea that it was neither more nor less than water, animal and organized water.

Long afterwards, when I had reached manhood, I was not less surprised at discovering on the shore some species of radiata—which, I do not remember. Through its transparent body I could distinguish the pebbles and the sand. Colourless like glass, of light consistency, trembling the moment it was touched, it seemed to me as it had seemed to the ancients, and to Réaumur also, who simply designated these beings "gelatinized water."

How much more readily do we yield to this impression when we discover in their early formation the yellowish white ribbons from which the Sea makes the soft outline or sketch of those solid fuci, and those laminaria, which, in due time turning brown, will become as hard as leather. But in their rudimentary and viscous condition, they possess the consistency, as it were, of a solidified wave, which is so much the stronger as it is the softer.

What we now know of the generation and complex organization of the inferior beings, vegetables or animals, prevents us from accepting the explanation afforded by the ancients or by Réaumur. But this does not preclude one from returning to the question first propounded by Bory de St. Vincent: "What is this *mucus* of the Sea, this viscosity which water in general presents? Is it not the universal element of life?"

Preoccupied with these thoughts, I repaired to an illustrious chemist, a man of a positive and solid intellect, an innovator as prudent as courageous, and, without preface, I abruptly launched my question at him:—"Sir," said I, "what, in your opinion, is that viscous whitish element which we detect in sea-water?"

"Nothing but life."

Then, by way of explaining an utterance too unguarded and too arbitrary, he added: "I mean to say, a matter half organized, and already capable of complete organization. In certain waters it is only a density of infusoria; in others, the element of life, the embryo which will *be* life. However, this subject has still to be studied; its investigation has not yet been seriously begun."

On leaving him, I went straight to a celebrated physiologist, whose opinion has not less authority with me. To him I put the same question. His answer was very long and very beautiful; I can give only its substance:—"We know no more of the constitution of water than we do of that of blood. As for the mucus of sea-water, what we can most clearly perceive is, that it is at once an end and a beginning. Does it result from the incalculable residuum of death which would yield it to life? Yes, undoubtedly, it is a law; but, in fact, in this marine world of rapid absorption, the majority of organisms are absorbed while living; they do not drag on existence to the last stage of death, as occurs upon earth, where the work of destruction is slower. The Sea is the purest element; war and death are its scavengers, and leave nothing offensive.

"But life, without arriving at its supreme dissolution, moults incessantly (*mue sans cesse*), and casts off everything superfluous. We terrestrial animals are continually sloughing the epidermis. These moultings, which we may call a daily and partial death, fill the world of the Seas with a gelatinous richness by which all nascent life immediately profits. It finds in suspension the oily superabundance of this general exudation, the still animated particles, the still living fluids, which have no time to die. Nothing of all this returns to the inorganic condition, but rapidly permeates into the new organisms. Of all hypotheses, this is the most probable; if you go beyond it, you plunge yourself into extreme difficulties."

Such ideas, the ideas of the foremost and gravest of living men of science, are not irreconcilable with those broached, some thirty years ago, by Geoffroy de St. Hilaire, in reference to the general *mucus* whence it seems nature derives all vitality. "It is," said he, "the animalisable substance, the first stage of organic bodies. There are no beings, animal or vegetable, which do not absorb it and do not produce it in the spring-time of their existence, however feeble they may be. Its abundance, in truth, increases in the ratio of their debility."

These last words open up to us a profound view of the ocean-life. Its children, for the most part, seem foetuses in the gelatinous state, which absorb and produce the gelatinous matter, overwhelming the waters with it, endowing them with the fertile softness of an infinite womb, where new-born organisms incessantly float as in a genial sea of milk.

Let us be present at the Divine work. Let us take one drop of the sea-water. We shall see in it the primitive creation recommenced. God does not operate in one channel to-day, and in another to-morrow. My drop of water, I do not doubt, will record for me all the transformations of the universe. Wait, and watch!

Who can foresee or divine the history of this drop of water? A plant-animal, or an animal-plant, which shall first emerge from it?

Shall this drop become the infusoria, the primal monad, which, by constant agitation and vibratory motion, shall soon develop into a vibrion? which, ascending step by step—polypus, coral, pearl—shall arrive, perhaps, in ten thousand years, at the dignity of the insect?

Shall there issue from the drop that vegetable thread, that light silky down which one would never suppose to be a creature, and which, nevertheless, is already the first-born hair

of a young goddess—a sympathetic and amorous filament, rightly called, *the hair of Venus?*

I utter no fable, but state a fact in natural history. This hair of twofold nature, vegetable and animal, into which our drop of water thickens, is, in truth, the eldest-born of life.

You see nothing when first you look into the depth of a fountain; after a while, you distinguish some slightly perturbed drops. With a good magnifying-glass, you make out this perturbation to be a small cloud; is it gelatinous or fleecy? Under the microscope the fleece becomes multiple, like a group of filaments, of very fine hairs—a thousand times finer than the finest woman's hair. Behold the first timid attempt of life to organize itself! These confervae, as they are called, are found universally in fresh water, and in salt water when it is at rest. They begin the double series—of plants of marine origin, and of those which become terrestrial on the elevation of the earth. *Out* of the water rises the innumerable family of mushrooms; *in* the water that of the confervae, algae, and other analogous plants.

It is the primitive, the indispensable element of life, and we find it already where it seems impossible. In the sombre chalybeate waters loaded and overloaded with iron, as in the hot thermal springs, you discover this light mucus and these tiny organisms, which have all the appearance of half-congealed drops, but oscillate and move to and fro. It matters little how we classify them; whether Candolle honours them with the appellation of animals, or Dujardin rejects them to the last rank of vegetables. They ask but to live, to begin by their modest existence the long series of beings which only become possible through them. These miniature animalcules, dead or living, offer up themselves for their support, and administer to them from below the gelatinous essence of life which they incessantly extract from the maternal waters.

It is without a shadow of probability that some writers put before us as specimens of the primal creation the fossils or imprints of complex animals and vegetables; of animals, such as the trilobites, which already possess the higher senses—the eyes, for example; or gigantic vegetables of powerful organization. It is infinitely more probable that far simpler organisms preceded these, and prepared the way for them; but their soft consistency has left no trace of their existence. How, indeed, could these feeble creatures have been preserved, when the hardest shells are penetrated and dissolved? In the Southern Seas fish with keen-edged teeth have been observed to nibble the coral, as the sheep nibbles the grass. The soft outlines of life, the animated jellies, which even now are scarcely solid, must have melted a million times before nature could frame her vigorous trilobites, her indestructible ferns.

Let us restore to these little ones—confervae, microscopic algae, beings hovering between two kingdoms, undecided atoms which alternate from the vegetable to the animal, from the animal to the vegetable—that right of primogeniture which, according to all appearance, is justly theirs.

Upon them as a foundation, and at their expense, the immense and marvellous marine Flora began to build itself.

At this starting-point I cannot refrain from expressing my tender sympathy for it; and three reasons induce me to bless it.

Whatever their size, these plants have ever three attractive characteristics:—

In the first place, their innocence. Not one of them is deadly. There is no vegetable poison in the sea. In marine plants all is health and salubrity, the benediction of life.

These innocent creatures ask only to nourish animal existence. Many, like the laminaria, possess a sweet sugary nature. Others have a wholesome bitterness, like the beauti-

ful purple and violet ceramia, which is better known as "Corsican moss." All concentrate a nutritious mucilage; especially several of the fuci, the sea-weed *Gelidium* made use of by the *Collocalia*, whose nests are eaten by the Chinese, and the capillary, so beneficial to fatigued chests. In all the cases for which doctors nowadays prescribe iodine, preserves made of wrack were formerly employed in England.

The third striking feature of this vegetation is its amorousness. This you would readily believe if you saw its strange hymeneal metamorphoses. Love is the effort of life to rise above its being and to possess a might beyond the power natural to it. We see it in the lucioles and other little animals which mount towards the flame; and not the less do we see it in plants, in the conjungariae, the algae, which, at the sacred moment, issue out of their vegetable life, usurping a higher one, and aspiring to be animals.

Where do these wonders begin? Where are made the first rude sketches of animal organization? Which is their primitive arena?

Formerly much discussion prevailed upon this subject. To-day all scientific Europe is of one opinion. I might borrow a reply from numerous accredited and standard works, but I prefer to quote from a memoir recently crowned by the Academy of Sciences, and invested accordingly with its high authority.

Traces of life are found in water with a temperature of eighty and even ninety degrees. It was only when the cooling globe sank to this temperature that life became possible. Water accordingly had in part absorbed the element of death, —carbonic acid gas. It was possible to breathe.

The Seas at the outset resembled those regions of the Pacific Ocean which are of inconsiderable depth, and besprinkled with small, low islets. These islets are ancient volcanoes, extinct craters, and only distinguishable by their

exposed summits, which the labours of the polypes have built up on high. But the bottom, between these volcanoes, is probably not less volcanic, and for the essays of the primitive creation, may have been a receptacle of life.

Popular tradition has long represented the volcanoes as the guardians of subterranean treasures, and as permitting at intervals the escape of the gold buried in their depths. This false, poetical idea is not without some degree of truth. The volcanic regions *do* really contain the riches of the globe, the puissant virtues of fecundity. They endow the barren earth. Life expands from the dust of their lavas, and their ever-warm ashes.

We know how great is the wealth stored up in the flanks of Vesuvius, in those valleys nestling among the long spurs which Etna stretches out to sea. We know what a paradise is formed under the Himalayas by the beautiful volcanic circus of the Cashmere Valley. We meet with a similar Eden at every step among the islands of the Southern Sea.

Under the most unfavourable circumstances, the neighbourhood of volcanoes, and the warm currents which accompany them, foster animal life in the most desolate regions. Among all the horrors of the Antarctic Pole, and in the shadow of Mount Erebus, Sir James Ross discovered corals living a thousand fathoms deep in the Frozen Sea.

In the early days of the world, its countless volcanoes exercised a far more powerful submarine action than they do at present. Their fissures and intermediary valleys permitted the marine mucus to accumulate in places, and electrify the currents. There, without doubt, the gelatine was formed, fixed itself, grew strong, and fermented in all its nascent power.

The yeast, or leaven, was the attraction of its substance for itself. Creative elements, naturally dissolved in the sea, formed combinations—I had almost said marriages. Elemen-

tary organisms appeared, at first to dissolve and die. Others, enriched by their debris, endured, as preparatory beings, as slow and patient creators, which, thenceforth, commenced beneath the waters the eternal toil of fabrication, and even now continue it under our own eyes.

The Sea, which nourished them all, distributed to each what would benefit it most. Each decomposing it in its own manner, and to its own advantage: some—as polypes, madrepores, shell-fish—absorbed lime; others—like the tuniciers of Tripoli, the wrinkled pearls—concentrated silica. Their debris, and their constructions, clothed the gloomy nakedness of the virgin rocks, daughters of fire, which had plucked them from the planetary centre, and hurled them forth sterile and burning.

Quartz, basalts, and porphyrys, and half-vitrified pebbles, all received from our little creators a less unnatural envelope of the soft and fertile elements which these derive from the maternal milk (as I call the mucus of the Sea), which they carefully elaborated and deposited, and by which they rendered the earth inhabitable. In these more favourable mediums could be accomplished the amelioration and elevation of the primitive species.

These works were developed at first among the volcanic islands, at the bottom of their archipelagoes; in those sinuous mazes, those peaceful labyrinths, where the wave only penetrates with discreet gentleness, which formed such genial cradles for the new-born.

But the expanded flower flourished in all its plenitude in the deeper gulfs, as, for example, in the Indian Seas. There Ocean wrought like a great artist. She bestowed upon earth those adored and idolized forms which love delights to create. By her assiduous caresses gradually rounding the shore, she gave it a maternal contour, and the visible tenderness—I was about to say, of a woman's bosom—all that the infant finds so sweet—shelter, warmth, and rest.

CHAPTER III.

THE ATOM.

ONE day a fisherman gave me the refuse of his net—three half-dead creatures, a sea-hedgehog, a sea-star, and a pretty *ophiura*, which still moved and stirred, and soon afterwards shed its delicate arms. I supplied them with sea-water, but, occupied with other cares, forgot them for a couple of days. When I again visited them, they were dead. Nothing was recognizable; the scene was entirely changed.

A thick gelatinous skin had gathered over the surface. I took up an atom on the point of a needle, and under the microscope it revealed the following peculiarities:—

A vortex of short, strong, squat, ardent animals (*Kolpodae*) swirled hither and thither, intoxicated with life—enraptured, I should rather say, at being born, and celebrating their natal day by a fantastic Bacchanal dance.

On a lower level swarmed a multitude of tiny serpents or microscopic eels; not so much swimming as vibrating, and in this manner impelling themselves forward (they are named *vibrions*).

Weary of so much movement, the eye in due time detected that all were not in agitation, that there were some of these *vibrions* in a rigid state, and that they continued perfectly quiescent. These were interlaced and bound up in clusters,

or swarms, which as yet had not detached themselves, and seemed to be awaiting the moment of deliverance.

In this living fermentation of beings still immovable raged, seethed, and foraged the disorderly mob of those squat Kolpodae, which appeared to depasture themselves freely among the helpless animalcules, to banquet and grow fat upon them, and live there at discretion.

Now observe that this grand spectacle was all displayed within the circumference of an atom taken up on the point of a needle. How many similar scenes would that gelatinous ocean, so quickly concentrated within the vase, have exhibited! Time had been marvellously utilized! The dead or dying out of their past life had immediately created a world. For three animals lost, I had gained millions; and these both young and full of life, transported by an all-absorbing and impetuous faculty of motion, by a veritable frenzy for living!

This infinite world, so strangely mixed up with our own, which is everywhere around us and in us, was scarcely known until very recently. Swammerdam and others formerly caught a glimpse of it, but were checked upon the very threshold. Many years later, in 1830, the magician Ehrenberg evoked it, revealed it, classified it. He studied the form and organization of these invisible beings, and their habits; he watched them in their various processes of absorption, digestion, navigation, hunting, contention. Their generation still remained obscure. What of their loves? Had they loves? Had Nature endowed these elementary creatures with the details of a complex generation? Or were they born spontaneously, like so much vegetable mould—the crowd said, like a mushroom?

At this important question more than one man of science smiled and shook his head. One is so sure that one holds in one's hand the mystery of the world, that one has established beyond the reach of change the great laws of life! Nature's

duty is obedience. When a person remarked to Réaumur, a century ago, that the female silk-worm could produce of itself, without the assistance of the male, he denied it, saying, "Nothing comes from nothing." The fact, always contradicted and always demonstrated, was at length fully established, not only as regards the silk-worm, but in reference to the bee also, a species of butterfly, and some other animals.

At all times and in all nations, among the wise few and the great body of the people, men have said, "Death begets life." They supposed, in particular, that the life of the minute animalcules proceeded directly from the debris bequeathed to them by death. Even Harvey, who first reduced to a formula the law of generation, did not venture to contradict this ancient superstition. When he said, *Everything springs from the egg,* he added, *or from the dissolved elements of previous life.*

This is precisely the theory which has recently been revived with so much *éclat* by M. Pouchet's experiments. He has established that the remains of the infusoria and other organisms creates the prolific jelly, the "generative membrane," whence no new beings are born, but the germs, the ovules, from which these new beings shall hereafter spring.

We live in an age of miracles. We must take our share of them. There is nothing astonishing in what we have just said.

Formerly we should have laughed had any one pretended that these animals, in scorn of all established laws, usurped the licence of breathing by means of their feet. Yet the noble works of M. Milne Edwards have clearly established this fact. In the same manner Cuvier and Blainville have observed that other beings supplied the want of regular organs of circulation by their intestines; but the thing appeared so monstrous to these great naturalists, that they never ventured to make it

public. It has been proved true in our own day by Milne Edwards and Quatrefages.

Whatever one may think of their birth, our atoms, once born, reveal to us a world of infinite and admirable variety. All the forms of life are already honourably represented in them. If they knew themselves, they might well believe that they composed, as a whole, a perfect harmony, leaving little to be desired.

These are not independent species, separately created. They clearly form a kingdom, wherein the various genera have organized a grand division of vital labour. Among them are collective organisms, like our polypes and our corals, ever engaged in undergoing the servitude of a common life. There are tiny molluscs which already attire themselves in dainty shells. Nimble fish and sportive insects are there,—haughty crustacea, the miniature likenesses of future crabs, armed to the teeth, even as they will be,—warrior atoms, absorbed in the incessant pursuit of their inoffensive congeners.

All this we discover in the midst of an enormous and awful wealth which quite humiliates the poverty of the visible world. Not to speak of those rhizipoda whose tiny mantles or hoods have partially built up the Apennines and accumulated the Cordilleras, the foraminifera alone, that all-numerous tribe of shell-clad atoms, comprises, according to D'Orbigny, two thousand species. We meet with them in every period of the world's history. Their representatives occur at different depths in the various cataclysms of our globe, sometimes altering in form, but always persistent as a genus, and continuing identical witnesses of the life of our planet. At the present day the icy current of the Southern Pole which the extreme American promontory divides between its two coasts, impartially despatches forty species towards La Plata, and forty towards Chili. But the great factory where they are created

and organized seems to be that warm river of the Ocean—the Gulf Stream—which starts from the Caribbean Sea. The northern currents kill them. Then the great paternal current conveys their dead bodies to Newfoundland and our Western Ocean, whose bed is composed of their remains.

When the illustrious father of these atoms—I mean their godfather, Ehrenberg—baptized them, patronized them, and introduced them into the world of science, he was accused of entertaining towards them too great a partiality, and it was said that he overvalued his tiny offspring. But he asserted that they possessed a very complicated and elevated organization. His liberality was so great, that he positively endowed them with one hundred and twenty stomachs. The visible world grew piqued, and, by a violent reaction, Dujardin reduced them to an extreme simplicity. In his opinion these pretended organs were only appearances. However, being unable to deny their power of absorption, he granted them the gift of improvising every moment stomachs *à propos*, according to the size of the morsels they desired to swallow. M. Pouchet, however, does not accept this opinion, but favours Ehrenberg's hypothesis.

One feature in their character is as incontestable as it is admirable—their vigour of movement.

Many have all the appearance of a precocious individuality. They do not long remain under the yoke of the communist and polypier life which their immediate superiors, the true polypes, are subject to. At the very outset the majority of these invisible beings are individuals—that is, beings capable of going to and fro at their own pleasure—free citizens of the world, who depend only upon themselves for the direction of their movements.

All that one could imagine of different modes of locomotion,

of methods of progress in the upper world, has been anticipated and surpassed by the infusoria. The fierce vortex of a potent star; of a sun which drags at its chariot wheels like planets the feeble ones it encounters; the less regular course of the bearded comet, which scatters or divides a host of half-formed worlds upon its passage; the graceful undulation of the lithe snake, which seems to swim or flow over the earth; the oscillating bark, which knows the opportune moment for tacking or beating about, so as to forge ahead the further; finally, the slow and circumspect crawling of our tardigrades, which support themselves upon, or attach themselves to, any kind of object;—all these different kinds of progression may be recognized among the apparently imperceptible children of Ocean. But with what marvellous simplicity of means! This one is but a thread, which, when it would move forward, coils itself up like an elastic corkscrew. That one, for oar and rudder, has only an undulating tail, or small trembling cilia. The pretty vorticellae, like vases of flowers, moor themselves together upon an island (such as a tiny crab, a little plant), and then isolate themselves by detaching their delicate peduncle.

But still more striking than their organs of motion is what we may call their expressions, their attitudes, their original signs of temperament and character. Some among them are apathetic, others very lively and fantastical; many breathe a keen desire for war; and not a few are always tossed in an apparently unreasonable haste and fruitless agitation. And sometimes, by dashing through a dense throng of tranquil and peaceable individuals, one deaf, blind, and imprudent block-head upsets and disperses all.

What a monstrous comedy! They seem to be rehearsing among themselves the drama which our own world—our noble and serious world of great visible animals—shall in due time enact.

At the head of the infusoria let us name, with some degree of respect, the majestic giants, the two chiefs of order, the lofty type of motion,—that of armed force, slow but formidable.

Take a handful of moss from a roof, soak it for a few days in water, and examine it with the microscope. A powerful animal, which we may call the elephant or whale of the infusoria world, moves with a vigour and grace of youthful life which these colossi do not possess. Respect it. It is the king of atoms, the rotifer, so named because on each side of its head it carries a wheel—a locomotive organ which assimilates it to a steamboat—or, perhaps, a weapon which assists it in capturing its tiny prey.

All fly, all submit; for one organization alone resists, which fears nothing, and trusts wholly to its arms—a monster already provided with superior senses. Observe its two great purple eyes. Slow of movement, and a true sloth, by way of compensation it is formidably armed, and has the faculty of sight. Its strong paws bristle with sharpest nails, which enable it to take hold with a singular tenacity, and at need—who will doubt?—are useful in the affray.

Oh, mighty beginnings of Nature, which, with so wonderful an economy of substance and matter, commences, out of very nothing, its majestic creative work! How sublime is its first opening stroke! These beings (what matters their size?) are endowed with a colossal capacity of absorption and movement not granted to those enormous animals we rank much higher in the scale of life.

The oyster clinging to its rock, the snail creeping on its belly, are to the rotifer what the Alps and the Cordilleras appear to me—objects so disproportionate, that they are not to be measured at a glance, and scarcely even by calculation and deep thought.

Yet what has become in these animal-mountains of the

nimbleness and ardour of life displayed by the rotifer? What a fall we make in ascending! My atoms were too full of vitality, were even dazzling in their rapidity of motion, while these gigantic beasts are struck with palsy!

What would be the result if the rotifer could form any conception of the collective existence wherein for ever slumbers, for example, the superb, the colossal starry sponge which we see at the Museum? The latter is to the rotifer what the terrestrial globe with its 28,000 miles of circumference is to man. And yet I am convinced that this comparison, instead of humiliating our atom, would stimulate it to a fresh access of pride, and it would exclaim, "I am great!"

Ah, rotifer, rotifer! We must despise no one.

Well do I perceive thy advantages and thy superiority. But who knows whether this life of captivity at which thou smilest is not a genuine progress? Shall thy rash license of vertiginous agitation be the limit of things? To take her point of departure towards loftier destinies, Nature loves to remain awhile in a condition of immovability. She enters the shadowy grave of that melancholy communism in which each element counts for so little. She learns to conquer the individual disquietude, to concentrate her substance for the profit of higher lives.

Therein she slumbers for awhile, like the Sleeping Beauty in the wood. But slumber, captivity, enchantment, whatever it may be, this condition is not death. It lives, that rough spongy mass, encrusted with silex. Without moving, without breathing, without organs of circulation, without any apparatus of the senses, it lives. How do we know this?

It brings forth twice a-year. It loves after its own way, and even far more tenderly than many other animals. And at the appointed time some tiny spheres emerge from the mother-sponge, and being armed with feeble fins, secure for

themselves some moments of liberty and motion. But soon acquiring a fixity of position, they exhibit a variety of delicate spongilles, which in their turn enlarge.

Thus in the apparent absence of senses and of every organ, in this mysterious enigma, on the dim uncertain threshold of life, generation reveals itself, and lays the foundation of the visible world through whose means we are about to ascend. As yet nothing exists, but already in this nothingness maternity appears. As with the gods of Egypt, Isis and Osiris, which begat before they themselves were begotten, here Love comes into life before Existence.

CHAPTER IV.

FLEUR DE SANG (FLOWER OF BLOOD).

AT the heart of the globe, in the hot waters of the Equator, and over their volcanic bed, the Sea so superabounds with life as to be unable, apparently, to equilibrize its creations. It rises far beyond a merely vegetable existence. Its offspring at the very outset nearly attain the completeness of animal life.

But these animals attire themselves with a strange botanical luxury, in the gorgeous liveries of an eccentric and luxuriant flora. You see, further than the eye can reach, flowers, plants, and shrubs; such you judge them to be by their forms and colours. Yet these plants have their motions; these shrubs are irritable; these flowers tremble with a nascent sensibility, on which the will exercises a considerable influence.

An oscillation which is full of charm, an equivoque completely graceful. On the borders of the two kingdoms, Mind, under these floating likenesses of a fantastic *féerie*, gives indications of awakening into activity. It is a dawn, it is an aurora. Its dazzling colours, its mother-of-pearl lights, proclaim the dream of the night and the thought of the coming day.

The thought! Do we dare use the word? No; it is still a dream, a vision, but one which gradually brightens, like the dreams of morning.

Already in Northern Africa, or on the other side of that continent, in the neighbourhood of the Cape, the vegetable world which reigned in solitude in the Temperate Zone sees itself encountered by animated rivals, which also vegetate, flower, rival, and soon surpass it.

The great enchantment commences, and goes on ever increasing as we advance towards the Equator.

Singular and elegant shrubs, the gorgons and the isis, unfurl their rich fan-like blossoms. The coral reddens under the wave.

Side by side with these glowing parterres of irises of every colour the stone-plants are found, the madrepores, all whose branches (or, shall we say, whose hands and fingers?) bloom with a rose-tinted snow like that of the peach and the apple. For seven hundred leagues on either side of the Equator this magical illusion prevails.

There are certain doubtful organisms, as, for example, the corallines, which are claimed by each of the three great natural kingdoms. These partake of the animal, and those of the mineral characters, while others have been adjudged to belong to the vegetable world. Perhaps this may be the actual point where life obscurely wakens up from its stony slumber, without positively detaching itself from this rude threshold of departure, as if to warn us, haughty as we are, and placed in so lofty a position, of the ternary brotherhood, of the right possessed by the humblest mineral to ascend and exist, and of the profound aspirations which stir the bosom of Nature.

Our meadows and terrestrial forests, says Darwin, seem deserted and empty when compared with those of the deep. And, in truth, every voyager who has traversed the transparent seas of the Indies is vividly impressed by the phantasmagoric spectacle revealed in their depths. Especially is he surprised at the singular exchange which takes place between

plants and animals of their usual appearance and natural signs. Certain soft gelatinous plants, whose rounded organs are neither stems nor leaves, affect the fleshiness and suppleness of the animal curves, seem desirous of deceiving us into a belief that they are really animals. The animals, on the other hand, have the air of mimicking the plants, and conforming themselves to the likeness of vegetables. All imitate the other kingdom. Some have the solidity and quasi-eternity of trees; others blossom and quickly wither, like flowers. Thus the sea-anemone opens like a pale rose-tipped daisy, or like a garnet-hued aster with eyes of azure. But as soon as a daughter, a new anemone, has emerged from its corolla, you see it melt and vanish.

Still more various is that Proteus of the waters, the alcyon, which assumes every form and every colour. Now it plays the part of the plant, now of the fruit; it spreads itself out like a fan, it flourishes like a bushy hedge, or curves into a graceful basket. But all this is fugitive, ephemeral, and of so timid a life, that at the slightest breath the whole disappears—returns in a moment to the bosom of the common mother. In one of these light forms you meet with a similitude of the sensitive plant; the cornularia, when touched, folds back upon itself, closes its breast, like the sensitive flower at the fresh air of evening.

When from above you bend over the edge of the reef or the coral bank, you see beneath the bright wave a carpet green with astreas and tubipores, funguses coiled up like balls of snow, meandrinas enriched with their tiny labyrinth, whose hills and dales are marked out in living colours. The cariophylla (or pinks) of green velvet, shot with orange, at the end of each calcareous branch, fish for their minute prey by softly plying in the water their rich stamens of gold.

Over this lower world, as if to shelter it from the sun, undulating like willows and lianas, or waving like plumes of

feathers, float the majestic gorgons, each several feet in length, and the whole forming, in conjunction with the dwarf plants of the iris, a perfect forest. From one tree to another the plumaria unrolls its spiral body, which one might take to be the tendril of a vine, binding them together by its light and slender branches tinted with glowing reflections.

This enchants, yet troubles you; it is a vertigo, and like a dream. The fairy spirit of the gliding mirages—the water—adds to these colours a prism of fugitive tints, a marvellous mobility, a capricious inconsistency, a hesitation, and a doubt.

What did I see? No; it was not.—Was it a being or a shadow?—Yes, truly, these are creatures, for I see a real world lodged here, and here disporting itself. Here the molluscs grow confident, and drag to and fro their pearly shells. Here the crabs grow confident, and run and pursue. Strange, short, corpulent fishes, clothed in gold and a hundred colours, here leisurely promenade. Purple and violet annelids wind about and agitate fiercely in the vicinity of that delicate star, the ophiura, which, in the sunlight, draws in and out, and alternately rolls and unrolls, its elegant arms.

Amidst this phantasmagoria, but with greater gravity, the arborescent madrepore displays its less vivid colours. Its beauty lies in its form.

But most marvellous is the *ensemble*, the noble aspect of this community; for the individual is modest, the republic imposing. Here it has the firm port of the aloes and the cactus. There, the stag's head and its superb antlered pride. Elsewhere it presents the vigorous branched growth of a cedar, which, after extending horizontally its robust arms, is ever and for ever rising higher.

These forms, stripped to-day of the myriads of living things which animated and covered them, possess, it may be, in their severe simplicity, a stronger attraction for the mind.

I love to see the trees in winter, when their slender

branches, released from the embarrassing profusion of their foliage, show us their own individuality, and delicately reveal their previously hidden personality. It is the same with the madrepores. In their actual nudity, when from paintings changed to sculptures, and become, as it were, more abstract in character, it seems as if they would make known to us the secret of those tiny peoples of whom they are the monuments. Many have the air of speaking to us in the mute eloquence of strange characters. Their intertanglements and complex coils are visibly intended to say something. Who will interpret them? What word is the key to their enigma?

We are to-day convinced that some thought lies hidden there. We cannot free ourselves from the sense of this mystery. We return to it, and we dwell upon it. We spell it out letter by letter, and think we understand it. Then the gleam of light flees from us, and in despair we smite our foreheads.

How far less significant is the cold geometry of the beehive! That is a product of life; but this, this is life itself. The stone was not simply the basis and asylum of the people; it was an *earlier* people—the primitive generation which, gradually crushed out by the young races coming after it, has assumed this everlasting consistency. Accordingly, all the movement and development of the primeval community lie there before us, visible and impressive, and in their glaring truthfulness, like each living detail of Herculaneum or Pompeii. Only that here all has been accomplished without violence and without catastrophe, by the order of natural progress, and consequently is endowed with serene tranquillity, a singular charm of gentle repose.

Every sculptor must admire the out-growth of marvellous skill which has based an infinite number of variations on the same leading principles, changing and renewing our decorative arts.

But we have to consider something very different from form. The arborescent luxuriances in which the activity of these laborious tribes exhausts itself,—the ingenious labyrinths which seem in search of a clew,—this profound symbolic sportiveness of vegetable life and all life,—is the effort of a thought, of a captive liberty, its timid gropings after the promised light;—the charming aspiration of the young soul still enthralled in the common existence, but desirous of emancipating itself softly, graciously, and without violence.

I have beside me two of these tiny trees, of an analogous species and yet different. No vegetable can be compared to them. One is of immaculate whiteness, like a lustreless alabaster, of a loving richness, which, on every branch, pours itself forth in buds, and bourgeons, and little flowers, without ever saying, "Enough." The other, less white and more compact, in every spar comprehends a world. Both are adorable in their likeness and unlikeness, their innocence, their fraternal character. Oh, who will explain to me the mystery of the infantine and attractive soul which has accomplished this fairy work! One feels it throbbing still, this free yet captive spirit,—captive in a captivity which it prizes,—dreaming of liberty, yet not altogether desirous of it.

Hitherto our arts have not availed themselves of these marvels, though they might profit so greatly by them. The beautiful statue of Nature (at the gate of the Jardin des Plantes) should have been surrounded by their treasures. We ought to exhibit Nature in that triumphal fairy pomp which never quits her. We must elevate, and without stint, from all her gifts even to the height of a mountain, the majestic throne whereon we have seated her. Her first-born—the madrepores—happy in being interred beneath, would have furnished the steps, depositing there their alabaster branches, their meanders, and their stars. Upon these their wavy

sisters would have made with their bodies and their delicate tresses a soft and living couch to embrace with the caresses of their tender love the divine mother in her dream of eternal fecundity.

Painting has succeeded no better in this respect than sculpture. She has painted the living flowers as she would have made flowers. These, at bottom, are of extraordinarily different colours. The coloured engravings with which we content ourselves convey but a very imperfect notion. Their dull, pale tints, whatever we may do, never render the unctuous softness, suppleness, warm emotion of these organisms. Enamels, if they were made use of, as Palissy attempted, would always be hard and cold; admirable for reptiles, for the scales of fishes, but too shining to reproduce those soft and tender creatures which have not even a skin. The little external lungs displayed by the annelids, the light, cloudy filaments which certain polypes put in motion, the mobile and sensitive hairs which undulate beneath the medusa, are not only delicate but affecting objects. They are of all hues, subtle and indistinct, and yet warm. They are like a breath made visible. You see in them an iris designed for the amusement of the human eye. But for *them* it is a serious matter; it is their blood, their life, translated into tints and reflexes, into fitful gleams, which kindle or grow pale, alternately thrill with being or sink into inaction.—Take care! Do not suffocate the little floating soul, which, though voiceless, tells you everything, and surrenders the secret of its mystery in these palpitating colours.

Colours do not long survive. Most of them melt away and disappear. The madrepores themselves leave behind them nothing but their basis, which one would think to be inorganic, and which, nevertheless, is really life, condensed and solidified.

Women, whose sense is subtler in this respect than ours, are not deceived; they have had a confused idea that one of these so-called trees, the coral, was a living thing. Hence their just preference for it. Science struggled to prove that it was a stone; afterwards, that it was nothing but a plant. They thought otherwise.

"Madam, why do you prefer to all these precious stones that tree of doubtful red?"

"Sir, it suits my complexion. Rubies make one pale. But this, duller and unpolished, warms by contrasting with one's whiteness."

She is right. The two objects are cognate; in the coral, as on the human lip and cheek, the colour is due to iron. It reddens the one and rose-tints the other.

"But, madam, these brilliant stones bear an incomparable polish."

"Yes; but see how soft the lustre of my coral! It has all the softness of the skin, and preserves its warmth. When I have worn it two minutes, it is my flesh and it is myself. I can no longer distinguish between it and me."

"Madam, there are much finer reds."

"Doctor, leave me this. I love it. Why? I do not know—or, if there be a reason, that which is as good as any other is, its Oriental name and true one: 'Flower of blood.'"

CHAPTER V.

THE WORLD-MAKERS.

OUR Museum of Natural History, in its too narrow confines, is a fairy palace. The genius of metamorphoses, of Lamarck and Geoffroy, seems to pervade the entire scene. In the gloomy saloon below, the madrepores silently lay the foundation of that more and more living world which is rising fast above them. At a higher level, the people of the seas, having attained a complete energy of organization in their superior types, makes clear the way for terrestrial organisms. Uppermost of all are the mammals. Over whom the divine race of the birds unfurl their wings and seem still to chant their music.

The multitude have no eyes for the mammals. They rapidly pass by those eldest-born of the globe. They find them cold and damp. They mount towards the light, towards the mass of brilliant objects. Mother-of-pearl, butterflies' wings, feathers of birds—these are the things which charm. I, who more frequently arrest my steps down below, have often been the only individual in the dark little gallery.

The other day, the first of October, being a little delayed, I read, though not without difficulty, the labels of some of the madrepores. On one, placed near a door, I perused the name, "Lamarck."

I felt a glow at my heart, a religious emotion.

A great name, and already ancient! It is as if we saw, among the tombs of St. Denis, the name of Clovis. The glory of his successors, their royalty, their warfare, have dimmed and thrown far back into the waste of years that name by which we pass, nevertheless, from one age to another. It is he, that blind Homer of the Museum, who, by the instinct of genius, created, organized, and named what was scarcely known before,—the class *Invertebrata*.

A class? nay, they are a world; an abyss of soft and semi-organized life to which was still wanting the vertebra, the osseous centralization, and the essential framework of the personality. They are all the more interesting, because it is clear that with them everything commenced. Humble tribes, hitherto so grossly neglected! Even Réaumur, among the insects classed the crocodiles. The glorious Buffon did not condescend to learn the names of this last and lowest populace; he left them outside the Olympian Versailles which he raised to Nature. They were constrained to wait—these great obscure and confused races, these exiles of science, which nevertheless fulfil all duties, and have laid the foundations of the living world. It was in truth the eldest born of Nature who were forbidden to cross the threshold. The beings really admitted would, if counted up, have been worth but little. Judging by numbers, one would be right in saying that those excluded and forgotten and banished from the gates were—Nature herself!

The genius of metamorphoses was at length emancipated by botany and chemistry. It was a bold but fortunate stroke to remove Lamarck from the botanical pursuits which had occupied his life, and to impose upon him the study of animals. This burning genius, accustomed to miracles by the transformations of plants—full of sublime faith in the oneness of

all life—evoked the animal creation, and that great animal, the globe, from the petrifaction in which they had previously lain. He re-established from form to form the circulation of mind (*l'esprit*). Half-blind, and with trembling hand, he intrepidly touched a thousand things which the clairvoyants would never have dared to approach. At all events, he breathed into them his own spirit. Geoffroy, Cuvier, and Blainville have found them warm and living, "Everything," he said, "lives, or has lived. All is life, past or present." A great revolutionary effort this against inert matter, which will continue until the inorganic is suppressed. Nothing will perish utterly. What has once lived may slumber and preserve a latent vitality, a capacity of restoration. Who is dead in fact and in truth? No one.

This saying has swollen with a mighty breath the sails of the nineteenth century. Either by accident or design, it has impelled us whither without it we should never have arrived. We are now launched on the voyage of inquiry, and demand of all things, as in the world's history, so in natural science, "What art thou? I am life!" Death has taken to flight before the inquiring gaze of Science. Mind, continuing its triumphal advance, ever forces it to retreat.

Among these resuscitated beings, foremost are my madrepores. Hitherto dead stone and lime, they now assume all the interest of life. When Lamarck re-united them with the living world, and expounded their nature at the Museum, they had just been surprised in the mystery of their activity —in their immense creations. We had learned of them how a world was made. We began to suspect, that if the earth makes the animal, the animal also makes the earth; and that the two accomplish for one another reciprocally the office of creation.

Animality is everywhere. It fills all and peoples all. We

discover its remains or its imprint even in the minerals; as in the statuary's marble and the alabaster, which have passed through the ordeal of the most destructive fires. At each step in our knowledge of the actual we come upon a colossal Past of animal life. From the day when optical science enabled us to detect the infusorias, we have seen them building up the mountains, we have seen them paving the ocean bed. The hard silex of the pumice-stone is a mass of animalcules: sponges are animated silex. Our limestones are all animals. Paris is built with infusorias. A part of Germany rests upon a sea of coral, nowadays engulfed and hidden. Infusorias, corallines, testacea—these are lime, these are chalk. Incessantly are they drawing it out of the Sea. But the fish which devour the coral give it back in the shape of chalk, and restore the latter to the waters whence it was originally derived. Thus the Sea of Coral, in its work of generation, its upheavals and its movements—in its grand constructions, which are incessantly being enlarged or weakened, built, ruined, re-built—is an immense fabric of limestone, which alternates between two lives; a life *active* to-day, a life *transferable* which *will act* to-morrow.

Forster has very clearly demonstrated (what had been erroneously denied) that these circular islands of coral are the craters of volcanoes elevated by the polypes. By no contrary hypothesis can their identical form be explained. This is always a small ring of about one hundred paces in diameter, very low, vexed and beaten externally by the waves, but inclosing in the interior a tranquil basin. A few plants, of three or four different species, crown, with a scanty chaplet of verdure, the interior lagoon. The water is of the most beautiful green. The ring itself, of white sand, the residue of dissolved corals, contrasts vividly with the intense blue of the outer ocean. Under the briny waters our workmen

labour, according to their species or their characters—the hardiest among the raging breakers; the mild, timid peoples on the calm and sheltered shore.

Surely this is a world of very little variety? Wait and see. The winds and the currents contribute to enrich it. A violent tempest only is wanted for the neighbouring islands to contribute their share towards the fortune of the new-comer. Nor is this the least magnificent function of the storms. The greater the hurricane—the more violent, the more vertiginous, whirling and tossing everything in its fury, —the more fertile will it prove. A waterspout sweeps over the islet; the torrent which it pours down is loaded with mud, and silt, and dead or living plants—sometimes with uprooted forests: in one black turbid flood it descends upon the sea, and quickly driven hither and thither by the waves, distributes its gifts among the surrounding islands.

The solid cocoa-nut is a grand messenger of life, and one of the most easily transported. Not only does it voyage to and fro, but, flung upon the reefs, if it finds but a handful of white sand, where other plants would perish it makes for itself a resting-place, and is content. The brackish water, which no other vegetable can endure, it counts as fresh water, and lives therein, and strikes deep its roots. It germinates, it puts forth its leaves and branches, it becomes a tree—a vigorous cocoa-nut palm. A tree, it is soon again resolved into fresh water, and rotten debris, and finally into earth, which attracts other trees, until ere long a palm-grove flourishes. The vapours, arrested by its leafy tops, are condensed into a stream, which, flowing from the centre of the island, in that silver-white ring keeps open a channel, which the polypes, as salt-water denizens, respect.

We can now understand the extreme rapidity with which they work. Some boats at Rio Janeiro, having accidentally

been neglected for a space of forty days, wholly disappeared under the depredations of a horde of tubipores. A strait, near the Australian continent, formerly included twenty-six islands. Already upwards of one hundred and fifty are perfectly well known; and the English Admiralty announces that the number is really greater, and that in twenty years, throughout its extent of fully forty leagues, it will be impracticable.

The eastern reef of Australia is three hundred and sixty leagues in length; and of this one hundred and twenty-seven without a single break. That of New Caledonia measures a hundred and forty-five. The single chain of the Maldives stretches for nearly five hundred miles. Add, also, the banks of the Mauritius, and the shallows in the Red Sea, which are incessantly rising.

Timor and its vicinity offer to our observation a world of purely animal conformation. Everywhere one treads on living things. The rocks are broken up into such fantastic forms and brightened by such radiant colours as to constitute a dazzling and imposing spectacle. Over an area of many leagues you may see them tranquilly toiling in the ocean-water, which is very shallow—about twelve inches in depth —tranquilly toiling, but continuing without pause or weariness their creative task.

Their first intelligent observer was Forster, the comrade of Captain Cook, who discovered them at their work, surprised them in the midst of their grand conspiracy to create myriads of islands in silence: myriads of islands; then chains of islands, and, gradually, a continent.

All this transpired under his eyes, as in the first days of the world. From the submarine depths the central fire heaves up a dome, a cone, which, yawning wide, erects a circular crater with its lava. Then the volcanic force grows exhausted. And this warm crater crowns itself with living jelly, animal and polypier, which, ever casting out of itself a

mucous matter, goes on building up this crater to low-water mark: not much higher, for, above, it would be always dry and exposed to the air; not much lower, for it aspires towards the light. If they have no special organ to perceive it, *it*, at all events, penetrates them. The powerful tropical sun, which pierces through and through their tiny transparent being, seems to exercise upon them the attraction of an invincible magnetism. When the sea recedes, and exposes them, they do not remain the less open; and they drink in the living light.

Dumont d'Urville, who so frequently explored their islets, has said:—"It is a strange punishment to behold, so close at hand, the calm of the interior basin; to see, all around you in the shallow water, the advanced banks, where the corals expand themselves in complete security, while you yourself are in the midst of a raging tempest." This gracious world is, nevertheless, a reef. Touch it, and you are dashed to pieces. The transparent sea reveals to you a sheer precipitous depth of a hundred fathoms. Do not place any reliance on your anchors. There is no cable, however strong, which the friction will not soon wear out and cut in twain. Your anxiety must be extreme during the long tropical nights, while the Southern tide impels you towards these keen cutting rocks.

Their innocent architects, however, are not without an answer to the accusations levelled at them. They say: "Give us time. These ridges shall after a while be levelled, and become hospitable. Leave us alone. Banks connected with neighbouring banks will be free from perilous and swirling eddies. We are creating a world to compensate for the catastrophe in which your own has perished. You will, perhaps, bless our labours hereafter, if a cataclysm should occur, if, as some one has said, the sea surges from one pole

to another every ten thousand years. In such a case you will consider yourselves very fortunate to find a refuge in these southern isles which we are creating.

"And confess," they continue to say, "that even if, unfortunately, a few vessels have perished here, our work is useful, grand, good, and noble. We are justified in feeling proud of our improvised world. Without speaking of its triumphantly beautiful colours, which out-dazzle those of Earth; without speaking of its graceful circles, or the curving outlines in which we so much delight—how many obscure problems, which have perplexed your philosophers, seem here to obtain a satisfactory solution? The distribution of work, a charming variety pervading a sublime regularity, a geometrical order which has, however, all the gracefulness of a nascent liberty: where will you meet with this among you men?

"Our incessant labour to lighten the water of its salts creates in the Sea those magnificent currents which preserve its life and salubrity. We are the spirits of the Ocean; we communicate its movement.

"Nor is it, we acknowledge, ungrateful. It comes at a seasonable moment to provide us with nourishment. And, with equal punctuality, the genial light caresses us, and clothes us in its luminous colours. We are the beloved of heaven; its favourite workers. All the younger born of this globe have need of us. Our friend, the cocoa-nut palm, that giant which inaugurates terrestrial life upon our world, cannot flourish unless by asking of us our dust to feed it. Vegetable life at bottom is the legacy, the gift, the alms of our profuse liberality. Deriving its wealth from us, it will nourish the higher creation.

"But what need is there of any other animals?

"We are in ourselves a complete, an harmonious, and an all-sufficient world. The circle of creation might conveniently close in us. Heaven will crown its new-made islands with

our work; on its ancient volcano of fire it has created a volcano of life, and, better still, has decreed the blossoming of this living paradise. It has done what it willed, and now goes to take its rest."

Not yet, and not yet. Another creation must rise by means of yours; a circumstance, however, which does not affright you. The new rival is not the tempest—you brave it; nor the fresh water—you build abreast of it. It is not even the Earth, which gradually invades and covers your structures. This other power, then, where is it? In yourselves! Every polype is not resigned to be nothing more than a polype. In your republic some restless creatures exist, who assert that even the perfection of this vegetative life is not life. They dream of an entirely different existence: to go forth and voyage alone; to see the unknown, the wide, wide world; to create, at the risk of shipwreck, a certain thing, which shall dawn in *them*, and remain obscure and shadowy in *you*.

I mean, the soul.

CHAPTER VI.

THE DAUGHTER OF THE SEAS.

I SPENT the early part of the year 1858 in the agreeable little town of Hyères, which, from afar, looks out upon the deep, the islands and the peninsula by which its coast is sheltered. The Ocean at that distance exercises, I think, a more potent charm than when one stands on its very margin. Attractive are all the ways which lead to it, whether one follows among the gardens the blooming hedges of jasmine and myrtle; or whether, ascending a little, one traverses the olive-groves, and a small wood of mingled laurel and pine. This wood does not preclude you from enjoying some occasional glimpses of the Sea. Not unjustly is such a place named Coste-Belle. There, in the sunny days of a mild winter season, we frequently met with an invalid who strongly excited our compassion; a young foreign princess, who had travelled some five hundred leagues to prolong for a few months her waning life. That life, though brief, had been sad and gloomy; and it was almost with joy that she saw herself dying. She moved about, supported and tenderly enfolded by the arms of one who lived in her life, and hoped not to survive her. If vows and prayers could prolong an existence, she had lived; for the vows and prayers of all men, and especially of the poor, were breathed on her behalf. But spring came, and with it

the end. On an April day, when all nature was springing into fresh life, we saw the two shadows still wandering through this wood, pale as an Elysium of Virgil.

We reached the shore of the gulf with our hearts full of a bitter thought. Among the rugged rocks, the pools left by the receding tide imprisoned a number of little animals which had been too slow in their movements to escape with the retiring waters. A few shells were there, all shut up in their tenements, and suffering from their exposure to the atmosphere. And among them, without shell, without refuge, wholly expanded, lay the living umbrella, which has inappropriately been named *Medusa*. Why was so terrible a name bestowed on so charming a creature?

I had never before suffered my attention to be arrested by the shipwrecked creatures we see so often on the sea-shore. This one was very little, about the size of my hand, but singularly pretty, with soft bright tints. It was of an opaline white, in which was merged, as in a cloud, a crown of tender lilac. The wind had turned it on its back. Its chaplet of lilac filaments waved above, and the delicate umbrella—that is, its actual body—finding itself underneath, clung to the rock. It trembled and shuddered throughout its poor body, for it was wounded, and those subtle filaments were torn, which are its organs of respiration, absorption, and even of love. Full upon it shone the Provençal sun, always so fierce and hard at its first rising, and rendered harder every moment by the dryness of the mistral* which mingled with its rays. A twofold shaft thus penetrated the transparent creature. Living in the ocean-midst, whose contact is soft and caressing, it arms itself with no resisting epidermis like terrestrial animals, and hence it was stung to the quick.

Near its dried-up rock-basin were other pools, full of water,

* The north-west wind which visits the south coast of France.

and communicating with the Sea. Safety was within a step. But this step was impossible to a creature which could only move by its undulating ciliae; and under so fierce a sun one might believe it would soon be dissolved, absorbed, and evaporated.

Nothing is more ephemeral, more fugitive, than those daughters of the Sea. There are some more fluid, like the light band of azure which naturalists call the Girdle of Venus, and which no sooner issues from the water than it is dissipated and passes away. The medusa, somewhat more tenacious of substance, suffers more in dying.

Was it dead, or dying? I do not readily believe in death, and I maintain that it lived. At all events, it was not much trouble to remove it from its place of torment and cast it in the adjacent pool. If I must tell the truth, it was with some repugnance I touched it. The delicious creature, with its visible innocency and the iris of its soft colours, was like a trembling jelly—it glided from my hands, and escaped my grasp. However, I contrived to remove it. I slipped my hand underneath it, and lifted with great caution its motionless body, from which all the filaments fell back, returning to the natural position they assume when swimming. Thus I conveyed it to the neighbouring lagoon. It sank, without giving any sign of life.

I walked to and fro on the margin. At the end of ten minutes my medusa reappeared. It undulated at the wind's breath. Positively, it stirred and floated. With singular grace, its filaments flying beneath, it swam about, and gently bore it from the rock. It did not go very quickly, but still it went, and soon I saw it at a tolerable distance off.

It will not be long, perhaps, before it is again capsized. It is surely impossible to navigate with feebler means or in more dangerous fashion. It has therefore a great dread

of the shore, where so many asperities wound and tear it, while, in the open Sea, the wind upsets it every moment. Accordingly, its fin-like filaments being underneath, it floats hap-hazard, the prey of fish, the delight of birds, who make a sport of carrying it away.

During an entire season spent on the banks of the Gironde, I saw the medusae fatally driven through the narrows, cast up by hundreds on the coast, and left to perish miserably. They were large, white, and very beautiful on their arrival, like great crystal lustres with sparkling diamond drops, which blazed in the sun like precious stones. Alas, how different was their condition at the end of two days! Fortunately the sand sinking beneath them soon provided them with a grave.

They are the aliment of all, and yet themselves have no other aliment than life scarcely organized, life still embryonic and vague, the floating atoms of the Sea. They benumb them, etherize them (so to speak), and absorb them without pain. They have neither teeth nor weapons—no defence. Only some few species (not all, says Forbes) can secrete, when attacked, a liquid which slightly stings, like the nettle. The sensation, however, is so slight that Dicquemare was not afraid to receive it in his eye, and did so with impunity.

We have then before us a creature very ill protected, and always exposed to great risks. Still it is of a superior order. It has certain senses, and if we may judge from its contractions, a notable susceptibility of suffering. Unlike the polype, it cannot be divided without injury. The former, under such circumstances, doubles itself; the latter dies. Gelatinous, like the polype, it seems an embryo; but an embryo too early withdrawn from the womb of the common mother, torn from its solid basis—from the association which ensures the safety of the polype—and launched upon a career of adventure.

How did the rash creature set out? How, without sail,

oar, or rudder, did it quit the harbour? What is its starting-point?

Ellis, in 1750, saw a little medusa rise upon a polype. In our own days several observers have noticed, and established beyond all question, that it is a form of the polype, sprung from association. The medusa, to speak plainly, is an emancipated polype.

What is there astonishing in this? very justly inquires Professor Forbes, who has studied them fully. It is only saying that at this stage the animal still follows the law of the vegetable kingdom. From the tree, a collective being, issues the individual—the detached fruit, which fruit will become another tree. A pear-tree is a kind of vegetable polypier, and its pear (a free individual) will give us a pear-tree.

In the same way—to cite Forbes once more—that a plant when about to assume its garb of leaves pauses in its development, contracts itself, becomes an organ of love, that is, a flower, the polypier, by contracting some of its polypes, and transforming their contracted stomachs, produces the placenta, the eggs, whence issues its mobile flower, the young and graceful medusa.*

All this one might have divined in the undecided gracefulness, the disarmed feebleness which dreads nothing, which embarks without any appliances of navigation, which trusts over-much to life. It is the first and pathetic outburst of the new soul, which has broken forth, though still without defence, from the safeguards of the common life, essaying to be all-sufficient in itself, to act and suffer on its own account —this soft vague sketch or outline of the free nature—this embryo of liberty!

To be all for one's self, to be in one's own self a complete

* "Annals of the Natural History," vol. xiv., p. 387.

microcosm—ah, the temptation is great for every one! the fascination is universal. Yet this fine madness is the secret of all the effort and all the progress of the world. But in their first attempts, there seems so little to justify it! One would say that the medusa was created on purpose to capsize.

Loaded above, and but ill assured below, it is the direct opposite of its congener, the physalis. The latter exhibits above the water nothing but a little balloon, an insubmergible bladder, and suffers its immensely long tentacles, twenty feet or more, which steady it, and sweep the sea, and paralyze the fish with torpor, and deliver it from its enemies, to drag along in the deep waters. Light and careless, swelling out its empearled balloon, tinted with azure or purple, it ejects, by means of its great ominous blue filaments, a subtle venom that smites like the lightning.

Less formidable, the sea-acorns are not more perishable. In form they resemble rafts or floats; their tiny organization has a certain solidity; and they are able to steer themselves, exposing to the wind their oblique sail. The porpites, in appearance only a flower, a daisy, are endowed with an extraordinary lightness, and even float after they are dead. It is the same with many other fantastic and almost aërial creatures, gardens of golden bell-flowers or rose-buds (such as the physsophora and stephanomia), azure-tinted girdles of Venus. All this life swims and floats invincibly, fears nothing but the land, strikes out afar into the wide Sea, and there, violent as may be its aspect, always finds its security. So little dread of Ocean is felt by the porpites and sea-acorns, that, possessing a power of constant natation, they have to exert themselves to sink, and when a storm comes on, take refuge in the depths.

Such is not the case with the unfortunate medusa. It has to fear the shore, and it has cause to fear the storm. It might make itself heavy at its pleasure, and descend, but the abyss

is prohibited to it; it can only see on the surface, in the full glare of light, and in the midst of peril. It is gifted with sight, hearing, and a very delicate sense of touch—unhappily much too delicate. It cannot guide its movements. Its complex organs overload it, so that it very easily loses its equilibrium.

One is, therefore, tempted to think that it repents of a freedom which it finds so perilous, and regrets the lower order but superior safety of the common life. The polypier makes the medusa; the medusa makes the polypier. It returns into an associated existence. But so wearisome is this vegetative life, that in the succeeding generation it again emancipates itself, and trusts to the chances of its fruitless navigation. In this fantastic alternation it eternally wavers. When mobile, it dreams of repose; when inert, of movement.

Such strange metamorphoses, which alternately exalt and depress the undetermined creature, and balance it between two such different states of existence, are very probably the fate of the inferior species, of medusae unable as yet to enter decisively on the irrevocable career of emancipation. As for the others, one can readily believe that their charming varieties indicate the internal progression of life, different stages of development; the sports and graces and mirthful outbursts of the novel freedom. Yonder admirable artist, upon the simple theme of a floating disc or umbrella, of a light crystal lustre kindled into glory by the sun, has wrought an infinite creation of beautiful varieties, a deluge of small marvels!

All these beautiful organisms, floating on the emerald mirror in their bright soft colours and the thousand charms of an infantine and unconscious coquetry, have embarrassed science, which, to find them suitable appellations, has been compelled to call to its aid the queens of history and the goddesses of mythology. This one is the wavy Berenice, whose rich tresses

spread like a torrent over the waves. And yonder is the little Orithyia, wife of Aeolus; and, at her husband's breath, she puts forth her pure white urn, which finds scarcely sufficient support in the delicate entanglement of her hair, often woven into a network beneath the wave. Lower down, Dionaea, the tearful, seems like a brimming cup of alabaster, which permits the splendid tears to overflow in crystalline bead-drops; such as I have seen scattered abroad by the cascades of Switzerland, in their weariness and languor, when, after too many curves and windings, they seemed to sink into the slumber of exhaustion.

In the gorgeous fairy illumination which the Sea displays on tempestuous nights, the medusa plays an independent part. Plunged, like so many other organisms, in the electrical phosphorus with which they are all saturated, it returns it after its own fashion and with a charming individuality.

How gloomy is night at Sea when this phosphoric lustre is invisible! How vast, how formidable, are its shadows! On land the darkness is less complete; we can always recognize the various objects which we touch, or whose outlines we can follow up; there are signs by which we cannot fail to know them. But the vast ocean-night—it is a black infinity! Nothing, everywhere nothing! A myriad dangers are possible, but unknown.

We are conscious of this even on the coast, when living opposite the sea. And great is our joy when, the air growing electrical, a light pale streak of fire appears on the distant horizon. What does it mean? We have seen it at home on a dead fish, as, for instance, the herring. But now alive, and in the great waves, in the long viscous trail which it leaves in its rear, it is infinitely more luminous. This splendour is by no means the privilege of death.

Is it an effect of heat? No; for you will meet with it at

both poles, and in the Antarctic Ocean and the Seas of Siberia. It occurs in our own waters, and in all.

It is the common electricity thrown off by the semi-vital waters in tempestuous weather—a harmless and pacific lightning, of which all marine creatures then become the conductors. They absorb and they expire it, and at their death restore it in considerable quantities. The Sea gives and resumes it.. Along the coasts and in the straits the eddying and battling waves promote its circulation. Every organism absorbs something of it—more or less, according to their nature. Here, immense tracts of tranquil infusoriae shine like a milky sea, with a soft white light, which afterwards growing more animated changes to the yellow colour of burning sulphur: there, luminous cones revolve upon their own axes, or roll along like fire-red balls. A great fiery disc—the pyrosoma—blazes forth; at first of an opaline yellow, then shaded with green, and next breaking out in a glow of red and orange, to subside finally into a sombre blue. In these changes may be noticed a certain regularity, indicating a natural function: the contraction and dilatation of a creature whose breath is fire.

Meanwhile on the horizon flaming serpents undulate over an infinite length; sometimes over an area of twenty-five or thirty leagues. The biphorus and the salpa,—transparent organisms which traverse the Sea and the phosphorus,—are the actors in this serpentine comedy. The wondrous association performs these frantic dances, and then breaks up. When separated, its freed members produce a swarm of little ones which are equally free—which in their turn will engender these dancing republics, and spread over the deep a bacchanal of fire.

Great waves of a calmer character march over the luminous floods. The sea-acorns light up the night with their tiny barks. The beroeas glow triumphantly like flames. None

are more magical than those of our medusas. Is it a pure physical effect, like that which impels the fire-injected salpæs to and fro? Is it an act of aspiration, such as others give us the idea of? Is it a caprice, as is the case with many organisms which sport in the scintillations of a vain and inconstant joy? No! the noble and beautiful medusas—like the crowned Oceania, like the charming Dionaea—seem the expression of graver thoughts. The luminous hairs beneath their body, like the gloomy lamp of one who watches, emit mysterious flashes of emerald and other colours, which, whether sparkling or waning, reveal a sentiment and an undefinable mystery. One would say it was the spirit of the abyss meditating over its secrets. Or the soul which has lived, or is some day to live. Or rather, must we not see in it the melancholy dream of an impossible destiny which will never attain its goal? Or the call to happiness of love which alone consoles us here below?

It is known that, as far as our terrestrial glow-worms are concerned, this spark is the signal, the avowal, of the lover declaring himself—indicating his retreat and disclosing his presence. Have the medusas this faculty? We know not. What is certain is, that they pour out simultaneously their flame and their life. It is with them the prolific sap, the generative virtue, which at every gleam escapes and diminishes.

If you wish for the cruel pleasure of redoubling this fairy illumination, you have only to expose them to the heat. Then they grow inflamed, they sparkle, they radiate, and become so beautiful, so wondrously beautiful! But the scene is finished. Flame, love, and life have fled, and all has simultaneously passed away.

CHAPTER VII.

THE STONE-BORER (LITHOPHYTES).

WHEN excellent Dr. Livingstone penetrated among the wretched races of Africa, whose hard lot it is to be ever on the watch against slave-dealers and lions, the women, seeing him armed with all the protecting arts of Europe, and rightly appealing to him as a friendly providence, uttered these pathetic words,—

"Give us sleep!"

It is the prayer which all living creatures, each in his own language, address to Nature. Every one longs for, every one dreams of, safety. We cannot doubt it when we see the ingenious efforts made to secure it; efforts which have been the creative source of all our arts. Man never invents one without discovering that the animals had invented it before him, inspired with the instinct, so strong and so permanent, of safety.

They suffer, they fear, they wish to live. We must guard ourselves against the idea that rudimentary and embryonic organisms have but little feeling. The contrary is certain. In every embryo, what is incomplete at first is the nervous system; that is, the capacity to feel and suffer. Pain is the spur by which forethought is gradually stimulated, and the wounded creature compelled to invent. Pleasure operates in the same way, as you may see in those organisms which you thought the most insensible. An exact observer has pointed

out the happiness which the snail experiences, after its painful love-quest, on encountering its beloved. Both, with graceful emotion, undulating their swanlike necks, engage in lively caresses. Who says this? The severe and ever-accurate Blainville.

But, alas! how widely is pain lavished! Who has not marked the slow and painful efforts of the shell-less mollusc dragging itself along upon its belly? A shocking but too painful image of the foetus which a cruel chance may have snatched from its mother, and thrown upon the ground naked and defenceless. The miserable creature thickens its skin with all possible speed, smooths down the asperities, and makes its road slippery. It matters not. It must undergo in due succession every obstacle, every shock, every keen, rude pebble. It grows hardened, and I would fain believe resigned. And yet at every contact it writhes, it contracts, it exhibits all the signs of a keen sensibility.

And yet, notwithstanding, she loves,—that great Soul of harmony, which is the unity of the world. She loves, and, by the alternation of pleasure and pain, educates every creature, and compels them to aspire.

But to aspire, to attain a higher rank, they must first have exhausted all the more or less painful experiences of the inferior one, all its inventive stimulants and instinctive art. It is needful also that they should have exaggerated their genus, should have discovered the excess which by contrast makes the want felt of an opposite genus. Progress thus takes place by a kind of oscillation between the contrary qualities which alternately disengage themselves from, and become incarnate in, life.

Let us translate these divine things into familiar human language, which is scarcely worthy of their grandeur, but renders them more intelligible.

Nature, being long engaged in making and unmaking the medusa, in varying *ad infinitum* so gracious a theme of nascent liberty, one morning smote her forehead, and exclaimed:—"I have conceived a felicitous idea, and it is charming. But I must insure the poor creature's life. It can only subsist by infinite numbers, by the excess of its fecundity. I must now create a being of greater prudence, and better protection. Let it be timid, if it must be so. But, above all, I will that it shall live!"

Our timorous creatures, as soon as they made their appearance, pushed their prudence to the extremest limits. They fled the light of day, and shut themselves up in darkness. To save themselves from the hard, dry, cutting contact of the stone, they employed the universal means—that of sloughing (*de la mue*). With their gelatinous skin they secreted a covering, a tube which would continue to elongate just as their road lengthened. It was a wretched expedient which induced these miners (the *testaceae—tarets*) to hide themselves from the light and the free air; and it causes them an enormous expenditure of substance. Each step costs them dear—the charges of a complete house. A creature which must ruin itself to live can only vegetate in poverty, and must be ever incapable of progress.

Nor do they find it a much better resource if they bury themselves for awhile; if they conceal their weakness in the sand at low-water, and reascend to-day when the tide returns. This is the expedient adopted by the sober. Such a life is variable and uncertain; and not only is it broken up twice daily, but is constantly more or less disquieted.

Among beings of a still lower grade, a certain something—still obscure, but destined to transform the world in the long-run—had begun to dawn. The simple sea-stars, with their five

rays, had at least some degree of support—an apparatus which *resembled* a framework of articulated pieces, outside of the spines and the suckers which advance or recoil at pleasure. A very modest but timid and serious animal seems to have profited by this rude experiment. It said, I think, to Nature:

"I am born without ambition. I do not ask for the brilliant gifts of Messieurs the Molluscs. I would neither be nacre nor pearl. I wish for no glowing colours—a luxury of adornment which would make me conspicuous. Still less do I desire the grace of your imprudent Medusas—the wavy charm of those fiery tresses, which by luring on the enemy effect their own ruin. O mother! I wish for one thing only: *to be*—to be a unity, without exterior and compromising appendages; compact, strong in myself, and rounded—for that is the form which will give the fewest exposed points; in a word, to be centralized.

"I have very little of the voyager's instinct. From high-water to low-water to roll occasionally is enough for me. Glued firmly to my rock, I would solve the problem for which your future favourite, Man, must seek in vain,—the problem of security: *strictly to shut out the enemy, while admitting the friend*—especially water, air, light. It will cost me, I know, much labour and continuous effort. But, clothed with movable spines, I will make myself shunned. Bristling like a bear, man shall call me a *sea-hedgehog*."

How superior is this sagacious animal to the polypes, enveloped in their own stony crust, which they make by pure secretion, without any real labour, but which at the same time affords them no security! How superior it seems to its very superiors—I mean, to many molluscs which possess the most varied senses, but have not the fixed unity of its vertebral outline, nor its persistent toil, nor the ingenious implements which this toil has suggested!

The wonder is, that this poor rolling ball, which we think a spiny chestnut, is *one*, and yet *multiple*—is *fixed*, and yet *mobile;* consisting of two thousand four hundred pieces, which can be undone at will.

Let us see how the echinus will create himself.

The scene is a narrow arm of the Sea of Brittany. He has not there a soft bed of fleshy polypes and algae, like the echini of the Indian Ocean, which can dispense with industry. He faces the peril, the difficulty; like the Ulysses of the Odyssey, who, tossed to and fro by the billows, attempted to fasten himself to the rock with bleeding nails. Each ebb and flow is for our little Ulysses a great tempest; but his strong will, his potent desire, make him cling so firmly to his rock that this constant embrace creates a sucker, which exhausts the air, and unites him to the very stone.

This is not all. Of his spines, which scratched and would fain have seized, one subdivides itself, and becomes a triple pincer, a veritable safety-anchor, admirably adapted to second the sucker, if the latter did not adhere firmly to the rough, unpolished surface.

When he has securely grappled his rock, and feels that he is established there, he comprehends more and more clearly that he has everything to gain if, from its present convexity, he could transform it into a concave surface, could hollow by degrees a little hole, and make himself a nest: for one is not always young—one has not always the same degree of energy. How great a happiness will it be if at a future day our learned echinus can relax something of that effort of anchorage which he now maintains both day and night!

Then he works away: it is his life. Framed of detached pieces, he works with five spines, which, always pushing forward in unison, solder themselves, and provide him with an admirable pick for piercing the rock.

This pick, with its five teeth of the finest enamel, is carried

in a framework of great delicacy, though very solid, formed of forty pieces. They glide in a kind of sheath, protrude, re-enter, and move with perfect ease. Through this elasticity they avoid all violent shocks; and, more, if they meet with any accident, they repair themselves.

It is seldom in stone, which he despises, but in the rock, in granite, that this hero of labour works. The harder and more tenacious the rock, the more securely does he feel himself established. Moreover, what matters it to him? To him all the ages are the same, and time has nothing to do with his undertaking. Should he die to-morrow, having spent his life and worn out his implements, another will establish himself there, and work away at the same place. These solitary beings exchange but few communications with one another during life; but death unites them in a sort of brotherhood, and the young survivor, who finds his task half-finished, blesses while enjoying it the memory of the admirable workman by whom it was begun.

Do not believe that his occupation is solely to strike, and still and ever to strike. He has an art of his own. When once he has thoroughly attacked the cement which unites the rock, and cleared the face of the latter, he bites off the projections as with small pincers, and roots out the silica. This is a work requiring excessive patience, with tolerably long intervals of rest, while the water also acts on the denuded places. Thus from the first stratum he can proceed to the second, and by this slow and sure progression arrive at his goal.

In his uniform life, however, as in that of the human artisan, crises will occur. The sea recedes from certain shores. In the summer the rock grows insupportably hot. He needs two mansions—one for summer and one for winter.

How great an event must such a removal be for a creature without feet, and bristling on every side with points!

M. Caillaud observed him upon such occasions with genuine admiration. The frail movable rods which playfully advance and recoil are by no means devoid of feeling, though to some extent protected by a secretion of soft gelatine, which we may reasonably suppose acts as a kind of cushion. Last of all, he must launch himself on these bristles, support himself upon them as on so many crutches, and by their means roll to and fro his Diogenes' tub, until, as he best can, he reaches port.

There, shut up anew, and in his bristly shell, and in the little nest which he almost always finds begun, he retires into himself, and enjoys alone his thrice-fortunate security. Let a thousand enemies attack him from without—let the wave thunder and roar—'tis all the same: it is for his pleasure. Let the rock quake beneath the shock of the billows: well does he know that he has nothing to fear—that it is his good nurse who causes the commotion. He is cradled—he sleeps—and he says to her, "Good-night."

CHAPTER VIII.

SHELLS—MOTHER-OF-PEARL—PEARLS.

IN the echinus we see the extreme limit of the art of defence. His cuirass, or, if you would rather call it so, his citadel of movable pieces—hard, durable, and yet sensible, retractile, and, in case of accident, reparable,—this citadel, based upon and invincibly anchored to the rock, or rather the whole imbedded *in* the rock, in such wise that the enemy has no means of blowing up its ramparts, is a complete defensive system which will never be surpassed. No shell will bear comparison with it, much less the works of human industry.

The echinus is the climax of the circular Radiata. They attain in him their triumph and their highest development. The circle is not capable of many variations. It is the absolute form; and in the globe of our sea-hedgehog, so simple and yet so complex, it reaches a perfection which terminates the first order of created life.

The beauty of the next order will consist in the harmony and exquisite balance of twofold forms, and in their graceful oscillation. From the molluscs up to man, every being is thenceforth composed of two associated halves; and in each animal we find, what is better than unity, *union*.

The master-work of the echinus had more than answered its object; a miracle of defensive ingenuity, it had made him

a prisoner; he was not only shut up, but buried; his asylum was also his tomb. His perfect isolation had completely sequestered him, thrust him aside out of the race, deprived him of all those conditions which are essential to progress.

That Progress may resume its gradual ascent, it must now descend to the lowest depths, to the elementary embryo, which at first will possess no other movement than that communicated by the elements. The new-born creature is the slave of the planet, to such an extent that, in its egg, it revolves like the earth with a double revolution; its rotation on its own axis, and its general rotation.

Even when emancipated from its egg, when it grows and reaches maturity of age, it will remain an embryo; hence its name, *mou*, or mollusc. It will represent with a vague dim outline the progress of the higher life. It will be the foetus, the larva, or the pupa, like that of the insect, in which, though all folded up and concealed, may nevertheless be discovered the organs of the winged being which has yet to be born.

I tremble for so feeble a creature! Though the polype was just as soft, it ran less risk of danger. All its parts being endowed with an equal vitality, it could not be destroyed by wound or mutilation; it lived on, and even seemed to forget what it had been deprived of. The centralized mollusc, however, is infinitely more vulnerable. How many portals are open to the attacks of Death!

The imperfect capacity of motion which distinguishes the medusa, and which may occasionally, by some fortunate accident, secure its safety, is only possessed in a very inferior degree by the mollusc, at least in its earlier stage. Its sole faculty is this: with the slough, the jelly which it exudes, to build up for itself a couple of walls, which act as substitutes for the armour of the echinus, and the rock to which the latter attaches himself. Two valves form a house: a light and

fragile tenement, which, in the case of the floating molluscs, is transparent. For those whose nature it is to adhere to other objects, their threaded and glutinous mucus furnishes a mooring cable, which naturalists call the *byssus*. It is composed, exactly like silk, of a substance which at the first is entirely gelatinous. The gigantic tridacna or clam (used in many churches as a holy-water basin) anchors itself so firmly by this cable as to deceive the madrepores, which, mistaking it for an island, build upon it, surround it, and finally suffocate it.

A passive, a motionless existence! It is disturbed by no other incidents than the periodical visit of the sun and the light; by no other action than the absorption of so much as reaches it, and the secretion of the jelly which forms its building material. The attraction of the light always operating in the same direction centralizes the sight. Behold its eyes! The secretion, fixed by an invariably uniform effort, constructs an appendage, an organ which, having at first served as the cable, afterwards becomes the foot; a shapeless inarticulate mass, capable of being used for any purpose. In those who float it acts as a fin; it is the punch of those who conceal and inter themselves in the sand; while of the creepers it forms the slightly contractile foot, by whose means they drag themselves along. Some there are who venture to curve it like an arch, and use it in taking their clumsy leaps.

An unfortunate race is this, so painfully exposed, hunted by every other tribe, dashed to and fro by the waves, and shivered into atoms by the rocks. Many who fail in building for themselves a house seek an asylum in some living bed. They demand shelter from the polypes, they lose themselves in the soft consistency of the floating alcyons. The avicula (pearl mussel) from which we obtain the pearl, seeks a little tranquillity in the cup of the sponges. The pinna nobilis dares only to inhabit the muddy herbage. The pholas niches itself in

the stone, and emulates the skill of the echinus; but with how notable an inferiority! Instead of the wonderful chisel which might well excite the envy of our stone-masons, it possesses nothing but a small rasp; and to work out a shelter for its fragile shell, makes use of that very shell!

With few exceptions, the mollusc is a timid creature, and knows that it is the prey of all other animals. Of this the cone is so well aware, that it never ventures from its hiding-place, and dies there from sheer dread of death. The voluta and the porcellana slowly and cautiously drag about their beautiful tenements, and hide them as much as they can. The cassis (helmet shell) has only the small foot of a Chinese woman with which to move its palace, and therefore almost entirely gives up walking.

Such their life, and such their habitation. In no other genus is there a greater identity between the nest and its inhabitant. In these, being derived from their very substance, the edifice is but a continuation of their fleshy mantle. It follows its forms and tints. The architect within this edifice is in itself the live stone.

For the sedentary, art is very simple. The inert oyster, fed by the sea, needs only a good stout case with a hinge, that it may leave the door ajar a little when the hermit would enjoy its repast, but shut it abruptly if there is any fear of itself becoming the meal of some hungry neighbour.

The work becomes more complex for the travelling mollusc, which says, "I possess a foot, a locomotive organ, and therefore I must walk." Its beloved house, however, it cannot abandon or regain at will. When it is on the march, this house is necessary to it, for it is then that its enemies attack it. Needful is it that it should protect the most delicate portion of its organism, the tree by whose means it breathes, and which, absorbing the air through its tiny roots, nourishes and repairs it. The head is a far less important part; many

lose it with impunity: but if the viscera were not always protected by a buckler, if they received any hurt or wound, the mollusc would die.

Thus, prudent and well armed, it goes in quest of its daily aliment. When day is done, will it pass the night safely in its open and exposed lodging? Will no indiscreet prowlers curiously pry within it? Or, who knows, test it with their teeth? The hermit bethinks himself of this possible peril, and employs himself industriously to guard against it; but his only instrument is his foot, which he employs for every purpose. This he develops after awhile into a hard tenacious appendage which serves instead of a door. He hinges it on the opening, and lo, it is snugly closed upon him!

The permanent difficulty, however,—the contradiction still existing in its nature,—is, that while it must be thoroughly protected, it must at the same time preserve its relations with the outer world. It cannot isolate itself, like the echinus. Its soft body can only be invigorated by the air and the light; these only can assist it in developing its organs. It has to acquire the senses of hearing and smell; the two guides of the blind. It has to acquire the power of vision, and it is needful, above all, that it should breathe!

Of this great and imperious function no one thinks when it is easily discharged. But if it pauses for a moment, how terrible are the consequences! Let but the lungs be gorged, or the larynx troubled, for a single night, and our agitation, our anxiety are excessive; we cannot rest; frequently even, at great risk, we throw open every window. We know that the asthmatic suffer so severely from this torture that, unable to make use of the natural organ, they invent a supplementary means of respiration.—Air! more air! or let us die!

When Nature is thus sorely pressed she becomes terribly inventive. It is no matter of wonder, therefore, if these poor

prisoners, choking in their close tenements, have found out a thousand appliances, a thousand kinds of valves, which afford them a little relief. Some breathe through lamellae disposed around the foot, others through a sort of comb, some by a disc or buckler, and many by their elongated ciliae; a few carry at the side their graceful plumes, or on the back a dainty little tuft which trembles, goes, comes, respires.

These sympathetic organs, which are in such continual dread of being injured, affect the most charming forms, so that one might say they *wished* to please, and to soften; that they asked for your indulgent favour. Their innocent sportiveness assumes every shape and every colour. Our tiny children of the Sea, the molluscs, with their infantine gracefulness of illusion, and their superb hues, are the authors of its eternal festival, and form its gorgeous decoration. However grave may be old Ocean, he is constrained to laugh.

Yet, with all this, the life of the timid is ever melancholy. One cannot help fearing that the beauty of beauties, the fairy of the Seas, the haliotis, suffers from her severe seclusion. She is gifted with a foot, and she can move herself, but does not dare.

"What hinders thee?"

"I am afraid: the crab lies in watch for me; the moment I open my house, will hurry in. A world of voracious fishes floats above my head. Man, our cruel admirer, punishes us for our very loveliness; pursuing us into the Indian Seas, even into the waters of the Pole, he carries us off by ship-loads."

The poor wretch, thus precluded from venturing abroad, has devised an ingenious means of procuring air and water. It makes little windows in its habitation which open on its tiny lungs. Hunger, nevertheless, compels it to risk its life.

Towards evening it crawls about a little, and pastures on the plants, which afford its sole nourishment.

Let us remark here, in passing, that these marvellous shells, not only the haliotis, but the veuve (white and black), and the golden-mouth, with its gilded mother-of-pearl, are poor herbivora, contented with the coarsest food:—a direct refutation of those who to-day believe in the beauty born of death, blood, murder, and a brutal accumulation of substance.

These molluscs can live upon almost nothing. Their food is before all and above all the light which they drink,—which they absorb in themselves,—with which they colour and irradiate their interior chamber. Each is twofold, and in itself is both the lover and the loved. As the palaces of the East present an exterior of gloomy walls, which conceal the marvels within, so here the outside is rough and rude, while the interior is of dazzling splendour. The hymeneal rites are solemnized by the fitful gleams of a small sea of mother-of-pearl, which, multiplying its mirrors, gives to the closed house the enchantment of a fairy-like and mysterious twilight.

It is a great consolation to possess, if not the sun, a moon in one's self, a paradise of soft nuances, which, ever changing without change, refresh one's motionless existence with that variety every creature stands in need of.

Children working in the mines ask of the occasional visitor neither money nor provisions, but "something to make light." It is the same with these children, our haliotides. Every day, though blind, they feel the light return, open themselves to it greedily, receive it, and contemplate it with all their transparent body. When it passes away, they preserve something of it in themselves, and brood over it in their amorous thought. They wait and they long for it. With this hope and this desire they nourish their tiny soul. Who will doubt but that at its return they enjoy much more keenly than we mortals do the rapture of awaking?—much

more keenly than we who are distracted by our manifold and varied life?

For them eternity passes in feeling and divining, in regretting and dreaming of, their great lover, the Sun. Without seeing it as we do, they certainly perceive that this warmth, this luminous glory, comes to them from without, from a great, powerful, and genial centre. They love this other Me, this grand Me, which caresses them, illuminates them with joy, inundates them with life. Had they the power, they would undoubtedly rush to meet its rays; and as it is, planted at their threshold, like the Brahmin meditating at the gates of his pagoda, they offer him in silence—what? the felicity which he confers, and a tender aspiration towards him. In this do we see the first blossoming of instinctive worship. It is the beginning of love and prayer, the imperfect utterance which a saint would prefer to more formal devotions, the "Oh!" with which Heaven is content. When the Indian says it to the Dawn, it knows that this innocent world of pearly and lustrous shells unites itself in thanksgiving with him at the bottom of the seas.

I can easily understand the emotion which the ignorant but fascinating heart of dreaming woman experiences, without knowing why, at the sight of a pearl. This pearl is not a person; but then, it is not a thing. Therein lies its destiny.

What an admirable whiteness! I would rather say,—purity. Virginal? no; far better. For virgins and young maidens, however gentle they may be, always possess a certain verdant youthfulness. The purity of the pearl resembles more the purity of the innocent bride, spotless, but owning the influences of love.

It has no ambition to shine. It subdues, nay, almost extinguishes its lustre. When you first examine it, you see nothing but a dead white; and it is only at the second glance

you begin to discover its mysterious iridiscence, and, as we say, its orientation.

Where has it lived? Ask you the deep Ocean. On what? Inquire of the sun. It has waxed strong upon light, and the love of light, like a pure soul.

It is a great mystery, but the pearl itself makes it intelligible. One feels that this gentle creature has long lived immovable and resigned in the quietude of patient expectancy, unwilling to do aught, or wish for aught, than the object of its love would do or wish for.

The child of the sea has centred its dreams in its shell, and the latter in its mother-of-pearl, and this nacre in its real pearl, which is simply itself concentrated.

The latter stage, however, according to naturalists, is only achieved as the result of a wound, of permanent suffering, a quasi-eternal agony, which attracts and absorbs its entire being, and annihilates its vulgar life in this divine poesy.

I have heard say, that the great ladies of the East and the North, more refined in their tastes than the rich parvenues of Europe, avoid the fires of the diamond, and suffer no gem to rest on their delicate skin but the soft pearl.

And, in truth, the lustre of the diamond wrongs the light of love. A necklace and two bracelets of pearl are a woman's harmony, a truly feminine ornament, which affects the spectator instead of amusing him, and intensifies the lover's tenderness. It seems to say, "Let us love! But not a sound!"

The pearl appears partial to woman, as woman to the pearl. And these Northern ladies never lay them aside after they have once begun to use them. They wear them day and night, and conceal them under their robes. On rare occasions you may catch a glimpse of the happy jewel, the inseparable collar, through their luxurious furs, always lined with soft white satin.

It is like the silk tunic which the odalisque—the fair queen of the Turkish seraglio—always wears underneath her other attire, and to which she is so excessively partial. She never abandons this favourite garment until it is completely worn out, in tatters, and hopelessly beyond repair, for she knows that it acts as a talisman, and is an infallible stimulant of love.

It is the same with the pearl.

Like the silk, it absorbs and drinks in the innermost life. An unknown virtue passes into it, a virtue from her whom we love. When it has slept for many nights upon her bosom, and in her warm embrace; when it has grown fragrant with the fragrance of her perfumed skin, and caught those fair delicate tints which madden the lover's heart, the jewel ceases to be a jewel; it becomes a portion of the person, and should no longer be exposed to the indifferent eye. One only has then the right to know it, and, in this exquisite necklace, to surprise the mystery of his beloved.

CHAPTER IX.

THE SEA-ROVER (THE POULPE, CUTTLE-FISH, CALAMARY).

THE medusas and the molluscs have been generally innocent creatures—one might almost say, children—and I have lived with them in a world of gentle peace. Among them there were few flesh-eaters; and such as were constrained to live in this wise killed only to satisfy their wants, and still for the most part fed upon elementary life, atoms, animal jelly, which is not even organized. Thus, then, pain was absent from their world. It was free from cruelty and passion. Their little souls, so soft and tender, were not without a ray of aspiration towards the light—towards the radiance which comes to us from heaven—and towards that of love, revealed as a changeful flame which, at night, becomes the joy of the deep.

Now we must enter upon a gloomier world—a world of strife and murder. I am compelled to own that from the beginning, from the first appearance of life, violent death made itself evident,—a rapid cleansing, an useful but a cruel process of purification of whatever languished, lingered, or might linger, of the slow and feeble creation whose fecundity had encumbered the globe.

In the most ancient formations of our earth we meet with two murderous creations,—the *Eater* and the *Sucker*. The former is revealed to us in the imprint of the trilobite, a

species now lost—the extinct destroyer of extinct beings. The second is extant in one frightful fragment—a beak nearly two feet long—which was that of the great sucker, cuttle-fish, or poulpe (Dujardin). Judging from such a beak, this monster, if its other parts were in the same proportion, must have possessed an enormous body, with horrible sucker-fringed arms of twenty or perhaps thirty feet in length, like a colossal spider.

A tragic matter this! These agents of death are the first we discover in the foundations of the earth. Must we say then that death preceded life? No; but the soft animals on which they fed have melted away, and left neither a trace nor an imprint of their existence.

Were, then, the eaters and the eaten two nations of diverse origin? From the undefined mollusc—a matter as yet common to all life, the superabundant force and plethoric wealth of the young world, then prodigalizing its aliment—at an opportune moment, two forms might be evolved, differing in appearance, but both directed towards the same end. It filled and swelled without limit the mollusc into a balloon, an absorbent bladder, which, the more it swelled and the hungrier it grew—being at first without teeth—sucked. On the other hand, the same force, developing the mollusc into articulated limbs, each of which made its own shell, became especially indurated at the claws or pincers, at the mandibles, which could bite and crush the hardest substances.

In this chapter let us confine ourselves to the former.

The sucker of the soft gelatinous world is itself gelatinous. While waging war against the molluscs, it still remains a mollusc—that is, it is always an embryo. It presents the strange, caricatured, and almost ridiculous appearance, if it were not terrible, of a warrior-embryo, of a cruel, furious, soft,

transparent, but tenacious foetus, breathing with a murderous breath. For it does not make war only to furnish itself with food, but from a lust of destruction. Even when satiated and bursting, it still destroys. Possessing no defensive armour, under its menacing manner it is not the less disquieted. Its safety is in attack. It looks upon every creature as a possible enemy. It flings about at random its long arms, or, more correctly speaking, its sucker-fringed thongs. Before battle, it ejects its paralyzing effluvia, its benumbing stenches, which render combat unnecessary.

Thus it has a twofold force. To the mechanical power of its tenacious arms, which twine round and enchain its victim, add the magical strength of this mysterious lightning; add, too, a vision and a hearing of extraordinary power. You stand appalled!

What, then, must it have been when the overflowing wealth of the primeval world—where they had never need to hunt for food, plunged, as they were, into a living sea of nutriment—swelled them indefinitely, these monsters of elastic skin, which extended *ad libitum?* They have decreased in dimensions. Yet Rang declares that he has seen one of the size of a hogshead. Péron, in the South Sea, met with another of equally colossal proportions. It rolled and tumbled in the deep with a great turmoil. Its arms, six or seven feet long, extending in every direction, simulated a furious pantomime of horrible serpents.

After these serious narratives, we ought not, it seems to me, to have rejected with laughter Denys Monfort's story of an enormous poulpe, which smote with its elastic thongs, entwined, and choked a large dog, despite of its teeth, its efforts, and howls of agony.

The poulpe is a terrible machine, and, like the steam-engine, can load itself with vapour, overcharge itself with

force, and so acquire such an incalculable power of elasticity that it can spring from the sea full upon a vessel. This circumstance explains the marvel which has induced some authorities to accuse the ancient navigators of falsehood. They once encountered, say they, a colossal poulpe, which, leaping on the deck, and embracing the masts and riggings with its prodigious arms, would have captured the ship and devoured its crew if they had not severed its arms with great blows from a hatchet. Thus mutilated, it fell back into the sea.

Some voyagers think that they have seen poulpes with tentacles sixty feet in length. Others maintain that in the seas of the North they have discovered a moving island half a league in circuit, which must have been a poulpe, or the formidable kraken, the monster of monsters, capable of fettering and absorbing a whale one hundred feet in length.

Such monsters, if they have ever existed, must have imperilled Nature: and they would have sucked up the globe but that, on the one hand, the giant-birds (for instance, the epiornis) made war against them; and, on the other, the Earth, as it grew better ordered, weakened and diminished the frightful chimeras by reducing the numbers of their available prey and cutting off their supplies.

Thank Heaven, our present poulpes are not quite so formidable. Their elegant species,—the argonaut, which swims so gracefully in its wavy shell—the beautiful cuttle-fish, with its eyes of azure—the calamary, an excellent navigator,—traverse the Ocean, and attack only diminutive creatures.

In them appears the idea, the shadow, of the future vertebral apparatus (the bone of the cuttle-fish, which we also trace in birds). They shine with all imaginable colours, and their skins change every moment, so that one might christen them the chameleons of the Sea. The cuttle-fish possesses that

exquisite perfume, ambergris, which one only finds in the whale as the residuum of the infinite number of cuttle-fishes it absorbs. The porpoises also effect a prodigious havoc. The cuttle-fish, which are social, and gather in herds or shoals in the month of May, all visit the shores to deposit their spawn. There the porpoises await them, and enjoy the most splendid banquets. These gentlemen are so delicate that they eat only the head and the eight arms—a tender dainty, and easily digestible. They reject the hardest portion—namely, the hinder part of the body. All the shore—as at Royan—is covered with myriads of these wretched and mutilated cuttle-fishes. The porpoises indulge in the most incredible bounds: at first to frighten their prey, and afterwards in giving them chase; finally, when they have finished their repast, they practise a variety of wholesome gymnastic exercises.

The cuttle-fish does not fail to excite our interest, notwithstanding the fantastic character it derives from its long beak. According to the play of light or its movements of respiration, all the hues of the most gorgeous rainbow rapidly succeed one another, and melt away upon its transparent skin. When dying, it still holds you with its azure eye, and reveals its last life-emotions by the fugitive gleams which mount from the bottom to the surface, and appear at intervals to disappear immediately.

The general decay of a class of so much importance in the early ages is less striking in the navigators—as, for instance, the cuttle-fishes—but conspicuous in the poulpe, properly so called, the sad inhabitant of our shores. He is not gifted, for the purposes of navigation, with the firm structure of the cuttle-fish, built up on an internal bone. He does not possess, like the argonaut, a resistant exterior—a shell which protects the more vulnerable organs. He does not own that pseudo-

sail which assists in voyaging, and enables its owner to dispense with rowing. He dabbles a little on the shore, where at the best he only merits comparison with the bargeman who hugs the coast. His inferiority teaches him habits of the most perfidious cunning, ambuscades, and, if one may say so, a timid audacity. He conceals himself, and lies snugly coiled up in the fissures of the rocks. His prey passes: suddenly he strikes with his outstretched thongs, by which the weak are stunned and the strong embarrassed. A man who while swimming is smitten in the same manner, may not trouble himself with so wretched an enemy. Spite of his sensation of disgust, he must seize hold of it, and—which is easy enough—turn it inside out like a glove. It then loses its strength, and succumbs.

One is shocked and irritated to have experienced a moment's fear, or at least apprehension. We should say, then, to this warrior, which comes breathing, snorting, and swearing towards us:

"Mock hero, there is no reality in thee. Thou art a mask rather than a being. Without base or security of position, thou hast nothing as yet of individuality but pride. Steam-engine that thou art, thou roarest and puffest, and thou art but a pocket; then, turned in and out, a soft flabby skin, a pricked bladder, a rent balloon; and to-morrow a—I know not what: a small quantity of sea-water dried up and vanished."

CHAPTER X.

THE CRUSTACEA: WAR AND INTRIGUE.

IF, in the first place, you pay a visit to our rich collection of mediaeval armour, and then, after having contemplated those heavy masses of iron which muffled up our knights, you go immediately to the Museum of Natural History and examine the arms of the Crustacea, you will be filled with pity for the arts of man. The former are a carnival of ridiculous, cumbersome, and overwhelming disguises, good for nothing but to suffocate the warrior and render him helpless; the latter, and especially the weapons of the terrible decapoda, are so frightful that if they were only enlarged to human stature, no one could endure the spectacle; the bravest would be shaken and magnetized with terror.

There they are posted in their battle-guise, carrying all lightly their formidable offensive and defensive arsenal—strong nippers, keen-edged lances, mandibles which would cut iron, and cuirasses bristling with darts which have but to embrace you to inflict a thousand wounds. Thanks be to Nature for making them of their present size; for otherwise who durst have combated them! No firearm could lay them low. The elephant would have hidden himself; the tiger have climbed the trees; not even with his thick hide would the rhinoceros have been safe.

You perceive that the interior agent, the motor of this

machine, centralized in its form—which is nearly always circular—gained through this circumstance an extraordinary power. The lithe elegance of man, his longitudinal form divided into three parts, with four principal appendages which diverge at some distance from the centre, make him, whatever we may say, a very feeble creature. In the old knightly armour the great telegraphic arms, the unwieldy pendent legs, give you the melancholy impression of a decentralized, powerless, and tottering being, whom a slight blow would lay level on the earth. On the other hand, in the crustacea the appendages are set so close together, and in such admirable relation to the round, short, compact body, that the slightest blow which it gives is given by the whole mass. When the animal pinches, pricks, or cuts, it does so with all its frame, which, to the very end of each limb, extends its complete energy.

It has two brains (head and trunk); but to render itself thus compact and insure this terrible centralization, the animal has given up his neck and has his head in his belly. Marvellous simplification! The head unites in one, eyes, feelers, pincers, and jaws. The moment the quick eye has sighted the prey, the feelers grope, the pincers grasp, the jaws crush; and in their rear, without any intermediary, the stomach, which has also a crushing or pounding machine, triturates and dissolves. In a moment all is finished: the prey has disappeared, and is digested.

In this creature everything is of superior excellence:—

Its eyes see before and behind. Convex, exterior, with many facets, they can embrace a great portion of the horizon.

The feelers or antennae—the experimental organs—are threefold in faculty: they have touch at their extremity; at their base, smell and hearing. This immense advantage we do not enjoy. Yet how important would be the consequences if the human hand could smell and hear! How rapid and comprehensive would be our observations! Dispersed among

three senses which work separately, the impression is frequently inexact or wholly lost.

Of its ten feet, six serve as hands, as pincers; and more, by their extremities they act as respiratory organs. The warrior thus extricates himself by a revolutionary expedient from the problem which has so greatly embarrassed the poor mollusc—"How to breathe, in spite of one's shell." To this he replies: "I shall breathe by the foot or hand. That defective point where I might afford a hold-fast to the enemy I shall include among my weapons of war. And let any one dare to attack it then!"

Their only formidable enemies are the storm and the rock. They voyage but little on the Sea's surface or in its depths. Nearly always they are haunting the shore and looking out for prey. Often while they are watching there for a yawning oyster on which to banquet, the tide rises, catches them, and rolls them hither and thither. Then their danger is in their armour. Hard and unelastic, it receives every blow direct, with considerable force, and not without great injury. Dashed against the projecting rocks, they are frequently split open or their claws broken off, and they only extricate themselves after having suffered cruel mutilations. Fortunately, like the echinus, they possess the faculty of reparation—of substituting a new member for any that is lost or damaged. Of this faculty they so well know the value, that when caught they will frequently shed a limb in order to effect their escape.

It seems that Nature has a peculiar partiality for these useful servants. Opposed to her infinite fecundity, she has endowed the crustacea with an infinite power of absorption. Everywhere we meet with them, on every shore, and as diversified as the Sea. Her vultures, gulls, and penguins share with the crustacea the important office of commissioners of health. Let any large animal fall, and in an instant the

bird works above, and the crab within and beneath, until its carcass is cleared away.

The little leaping crab, which one might mistake for an insect (*le talitre*), occupies the sandy shores, burrowing its habitation in the sand. When a wreck throws upon the beach a quantity of medusas or of other bodies, you may see the sand begin to undulate, to move with a rolling motion, until it is wholly covered with clouds of these dancing skeletons, which, swarming and leaping, gaily take possession of the scene, and labour to cleanse it thoroughly before the return of the tide.

Of a large size, vigorous and astute, the crabs or cancers are a fighting race. They so thoroughly possess the warlike instinct, that they understand the use of sound in terrifying their enemies. In a menacing attitude they advance to the fight, with pincers raised aloft, and rattling their nippers together. Yet before a superior force they are duly circumspect. I have frequently watched them, at low-water, from the summit of a rock. But though I was placed so high above them, the moment they found themselves observed, the multitude have beaten a retreat; the warriors, running sideways, as is their wont, returned every one to its asylum. They are not so much Achilles as Hannibal. When they know themselves to be strong they attack. They eat both the living and the dead. A wounded man has great cause to fear them. It is related that in a desert island they devoured several of Drake's seamen, having assailed and overwhelmed them with crawling legions.

No living being can combat them on equal terms. The gigantic poulpe, which suffocates the smaller crustacea, risks the loss of its tentacles. The most voracious fish hesitates before swallowing a creature so bristling with spines.

When the crustacean has reached its full size, it becomes

the tyrant and the terror of the two elements. Its unassailable armour fits it for universal attack. It would multiply to excess, and disturb the balance of created life, if in this very armour did not lie its peril and its snare. Fixed and hard, and not conforming to any of the variations of life, it is the creature's prison.

To open through this cuirass a means of respiration, Nature has placed a valve or gate in a casual limb which is frequently lost—the claw. To provide for its growth, for the progressive extension of its internal organs, it is needful that the cuirass —a thing full of danger—should, at certain times, when flabby and softened, be no more than a skin. So great a change can only be effected by its despoiling and stripping itself—by its flinging away a part of its body. It is a complete sloughing or moulting. The eyes and the branchiae, which serve them instead of lungs, undergo this alteration, like all the rest.

It is a curious spectacle to see the crab agitating, tormenting, and overturning itself during this peculiar process. So violent is the operation, that it sometimes breaks its claws. It then remains exhausted, weak, and defenceless. In two or three days the lime is re-deposited and the skin hardened. But the crab is not let off so easily: some time elapses before it resumes its armour. And until then it is the quarry of all creatures, even of the feeblest. Justice and Equality assert themselves with terrible force. The victims have their revenge. The strong submits to the law of the weak, descends to their level, as a species—to the great equilibrium of death.

If one died but once here below, there would be less cause of grief. But every being which has life must die to a certain extent daily—that is, must slough or moult—must undergo that partial death which renews and invigorates life. Hence results a condition of weakness, and also of melancholy, which one does not readily acknowledge. But what is to be done?

The bird which changes its plumage in due season is sad. More sorrowful the poor snake during its great renewal of its skin. Man too sheds his skin and every tissue monthly, daily, every minute; he loses a little of himself incessantly, but softly. He is not stricken down, but only weakened, in a vague and dreamy moment, when the vital flame flickers to shoot up again with increased lustre.

How terrible must be this event for a creature which has to change its whole structure simultaneously, to disjoint its framework, to separate and tear off its inflexible covering! No wonder that it is overpowered, crushed, faint, absent from itself, a prey to the first comer!

The fresh-water crustacea die in this manner twenty times in a couple of months. Others, such as the sucker-crabs, succumb to this fatigue, cannot refit themselves as before, but grow deformed, and lose all motion. They give in, so to speak, their resignation as hunters. They cowardly seek an idle and parasitical life, a shameful asylum in the viscera of larger animals, which, in spite of themselves, are forced to nourish them, to exhaust themselves for their advantage, and to hunt and toil in their behalf.

The insect, in its chrysalis state, appears to forget, ignore, and remain an entire stranger to these sufferings; one might even say that it seems to enjoy this relative or partial death, like an infant in a warm cradle. But the crustacean, while sloughing, sees and knows what it is; precipitated suddenly from a life of the highest energy to a deplorably powerless condition. It seems bewildered and dismayed. The only thing it seems capable of is to hide under a stone and wait tremblingly for the issue. Never having encountered any formidable foe or serious obstacle, having been absolved from the need of work by the superiority of its terrible weapons, the moment that these fail it, it is wholly without resource.

Association might perhaps protect it, if the sloughing time did not occur for all at once, and if each at this moment were not equally disarmed, and rendered incapable of defending the sick by its own sickness. It is said, however, that in certain species the male will protect the female and follow her, so that if she is caught, both are taken together.

This terrible slavery of the sloughing season, the fierce pursuit of man (who daily asserts a complete sovereignty over the shores), and, finally, the disappearance of ancient species which nourished them abundantly, are the causes of a certain decay of the crustacea. The poulpe, which is utterly useless, which man neither hunts nor eats, has greatly decreased both in size and number. How much more is this the case with the crustacea, whose flesh is so excellent, and for which all nature has a keen relish and appetite!

They have the air of knowing it. Those among them who are weakest devise—we will not say arts for self-protection, but—all kinds of coarse little frauds. They invent and they intrigue. The latter word is a true one. They play the part of intriguers, of the unclassified individuals who, without any avowed profession, live by means of indifferent expedients and resources. Factotum bastards, neither flesh nor fish, they prey a little on everything—on the dead, on the dying, the living, sometimes on terrestrial animals. The oxystoma makes himself a mask, a visor, and prowls about at night. The birgus, as soon as evening comes, deserts the sea, and goes on a foray, climbing even the cocoa-nut trees and eating the fruits, when it can find no better food. The dromias conceal themselves in foreign bodies. The hermit-crab, unable to complete the induration of its armour, conceives the idea of preserving the portion which remains defenceless by becoming a pseudo-mollusc. It looks out a shell about its own size, devours the inhabitant, and fits itself

to the stolen habitation so exactly, that it is able to carry it to and fro. Thus disguised, it sets out in the evening in quest of booty. You can hear and recognize the pilgrim by the noise of the shell, which it cannot prevent from clattering as it limps and staggers along.

Finally, others of an honester temperament, discouraged by the motion and the combats of the sea, make for the shore, as less convulsed and less warlike. In winter, and nearly all the year round, they reside there and construct their burrows. Perhaps they would undergo a complete transformation, and constitute themselves insects, if they did not retain an affection for the Sea as the home of their loves. Just as once every year the twelve tribes of Israel repaired to Jerusalem and celebrated the Feast of Tabernacles, you may see on certain coasts these faithful servants of the great Deep come to offer her their homage, to entrust the sublime and generous nurse with their offspring, and recommend them to the care of her who cradled their ancestors.

CHAPTER XI.

THE FISH.

THE free element, the Sea, must sooner or later create for us a being closely resembling it — a being eminently free, sliding, undulating, fluid, gliding like the wave, but deriving its marvellous mobility from the internal miracle, still grander, of a central organism, subtle and strong, and very elastic, such as hitherto no other creature has in any wise approximated.

The mollusc crawling on its belly was the poor slave of the land. The poulpe, with its pride, its bombast, its snorting, a poor swimmer and no walker, was no less the slave of chance. Without its paralyzing power it had not survived. The bellicose crustacea, alternately so lofty and so humiliated, the terror and the ridicule of all, undergoes at intervals a miserable punishment, and is the prey and the sport of even the weakest.

These conditions of slavery are severe and terrible; how shall we disengage ourselves of them?

Freedom consists in strength. At its origin, timid and irresolute, life, in its search after strength, seemed to dream confusedly of the future creation of a central axis which should become the unity of being (*l'être un*), and increase tenfold its vigour of movement. The radiata and the molluscs had dim foreshadowings of it, and sketched out some rough rude out-

lines; but were too distracted by the overwhelming problem of external defence. The outer covering, it was always the outer covering which incessantly preoccupied these poor creatures. In this direction they accomplished masterpieces: the spiny ball of the echinus—the shell simultaneously open and closed of the haliotis—finally, the armour of the crustacea with its articulated pieces, at once the perfection of defence and terrible in attack! What more? What can be added to this? Apparently, nothing.

Nothing?—no, everything. Let there be created a being which shall trust its safety to its rapidity of motion—a being of unrestrained audacity, despising all other creatures as feeble or slothful, and which, looking upon the outer covering as a subordinate affair, concentrates all its strength in itself.

The crustacea enveloped its life, as it were, in an external skeleton. The fish places it in the centre, in its innermost interior, on the axis to which the nerves, the muscles, and every other organ are attached.

It seems a fantastic invention, and the reverse of good sense: to place the hard and the solid precisely at the place which is so well defended by the flesh! To put the bone, so useful externally, in the inside, where its hardness will be of so little profit!

The crustacean must have laughed when it saw for the first time a soft, fat, squat creature (the fish of the Indian Seas) gliding and sliding along without shell, armour, or defence; all its strength centred within—protected solely by its viscous fluidity—by the exuberant mucus which surrounded it, and which, by degrees, is condensed into elastic scales, a soft cuirass, stretching and folding, and yielding without yielding completely.

It was a revolution analogous to that of Gustavus Adolphus

when he lightened his soldiers of their heavy iron mail, and substituted as a covering for the chest a close coat of chamois leather, strong, light, and supple.

A bold but a prudent revolution. Our fish being no longer, like the crab, a captive to its armour, is by the same stroke delivered from the cruel condition attaching to that armour; the sloughing, the danger, the weakness, the effort, the enormous expenditure of force which then occurs. It sheds its skin slowly and by degrees, like man and the higher animals. It spares and accumulates life, creates within itself the treasure of a powerful nervous system, with numerous telegraphic fibres which communicate between the spine and the brain. Whether the bone be wanting or very soft, whether the fish still retains an embryonic appearance, it does not the less enjoy its complete harmony of being through this rich network of nervous filaments.

We do not find in the fish the elegant weakness of the reptile and the insect, which are frequently so slender that in certain places you can cut them like a thread. It is segmented as they are, but these segments are underneath, well hidden and well defended. By their assistance it can contract itself without being exposed, as they are, to the risk of a too easy partition.

Like the crustacea, the fish prefers strength to beauty, and for this purpose suppresses the neck. Head and trunk, all is one mass: an admirable element of strength, whence it results that for cutting the water, it can strike with enormous energy; if it choose, with a thousandfold more energy than it absolutely requires. Thus it is a dart, an arrow, a flash of lightning.

The interior bone, which in the cuttle-fish appeared unique and unformed, is here a great system: one, yet multiple: *one*, as far as regards the force of unity; *multiple*, for all purposes of elasticity, and for attaching itself to the muscles, which, by alternate contraction and dilatation, create its faculty of move-

ment. It is a wonder, a veritable wonder, this form of the fish, so compact when viewed from without—so contractable within—this keel with such fine flexible sides (as in the herring and the shad)—with the motor muscles attached which act by alternate motion. Thus he exposes externally nought but his auxiliary oars, his short fins which incur little risk, but, strong, and sharp, and viscous, wound, or elude, or escape. How superior is all this to the poulpe or the medusa, which presented to every comer its soft fleshy tentacles, a dainty morsel for the appetite of the crustacea or the porpoise!

To sum up all, this true son of the water, movable as its mother, glides through the wave by its own mucus, cleaves it with its head, dashes it aside with its muscles (all closely compacted upon its vertebra, on its slender undulating sides), and finally, with its stout fins cuts, and rows, and steers.

The smallest of these powers would suffice, but it unites them all—the absolute type of movement.

Even the bird is less mobile, in this sense that it requires to rest itself. At night it is fixed, but the fish never. When asleep, it continues to float.

Though so excessively mobile, it is at the same time robust and vivacious in the highest degree. Wherever there is water, you will be sure to find it; 'tis the universal inhabitant of the globe. In the loftiest lakes of the Cordilleras and the Asiatic mountains, where the air is so highly rarified that no other being can exist, there, in the utter solitude, the fish alone contrives to live. It is the gudgeon and the red fish (the perch?) which have the glory of thus seeing all the earth beneath them. In like manner, in the great depths and under frightful pressure swarm the herring and the cod. Forbes, who divides the sea into twelve strata or superimposed stages, has found all of them inhabited, and in the lowermost, which one would believe to be so sombre, he has discovered a fish furnished with admirable visual organs, which consequently can see and

obtain sufficient light in what appears to us a truly nocturnal obscurity.

But the fish has yet another privilege. Numerous species —the shad, the salmon, the eel, the sturgeon—flourish equally in fresh and salt water, and regularly alternate between the one and the other. Many families of fishes have some species marine, and others fluviatile (as, for example, the ray, the bar).

Nevertheless, to some extent, temperature, food, and custom seem to fix and enclose them in the free ocean-element. The hot Tropical Seas are like an impassable barrier to the Polar species. On the other hand, the Tropical kinds are arrested by the cold currents of the Cape of Good Hope. Only two or three species of cosmopolitan fish are known. Few frequent the high seas. The great number are littoral, and partial to certain coasts. Those of the United States are not those of Europe. Add some specialities of taste, which, though they do not completely fetter, yet to a considerable extent restrain them. The ray dabbles in the mud, and the soles in the sandy shallows; the bull-heads creep in the upper waters; the murrey haunts the rocks; the perch the pebbly beach; the balistas frequent the shallow water over a bed of madrepores. The scorpena alternately swims and flies: pursued by the fishes it springs aloft, and supports itself in the air; until, chased by the birds, it plunges immediately into the waves.

The popular proverb, "Happy as a fish in the water," expresses a truth. In calm weather an air balloon, more or less expanded, it can lighten or augment its gravity at will, and navigate with the utmost ease suspended in the waters. It floats onward in peace, caressed by the wave, and sleeps, if it pleases, on its route. It is at the same time embraced and isolated by the unctuous substance which renders its scaly skin so slippery and impervious. Its medium varies little; is

nearly always the same, not too hot and not too cold. How terrible a difference prevails between this felicitous existence and the life allotted to us inhabitants of earth! At every step we are encountered by rude obstacles. The uncongenial earth piles up stones in our path, fatigues and exhausts us by the effort of mounting, descending, and remounting its acclivities. The condition of our atmosphere varies, and often very cruelly, according to the seasons. The cold rain falls for days and nights with pitiless fury, soaking and chilling us, sometimes freezing our very hair, and encrusting our shivering bodies with its sharp-pointed crystals.

The happiness of the fish, its fortunate plenitude of life, are demonstrated under the Tropics by its luxuriant colours, and in the North by its vigour of movement.

In Oceania and the Indian Seas they sport about, wandering and vagabondizing, under the grotesquest forms and in the most fantastic attire; performing their joyous feats among the corals and living flowers. The fish of our cold and temperate seas are great sailors, powerful rowers, true navigators. Their lithe and elongated forms make them swift as arrows. Every shipbuilder may learn a lesson from them: some have as many as ten fins, which, at pleasure oars and sails, may be held quite open, or partly furled. That wonderful rudder, the tail, is also the principal oar. In the best swimmers it is forked; the whole of the spine abuts upon it, and contracting its muscles, propels the fish.

The ray beats the waves with two immense fins, two great wings. Its long, supple, and slender tail is an arm to strike, and a blade to cleave and divide the density of the surge. So thin that it displaces little water, and working in an oblique direction, it is therefore easily balanced, and does not require the bladder which supports the thicker fishes. Thus, then, all are provided with apparatus suitable to the medium in which they live. The sole is oval and flat, that it may glide

more readily in the sand. The eel, which rolls in the mud, assumes a serpentine form, and may be compared to a long ribbon. The lophiadae (or "sea-devils"), which must often live hooked on to the rocks, are furnished with hand-like fins, and remind one of a frog rather than of a fish.

As *sight* is the sense of the bird, so is *smell* that of the fish. The falcon, high among the clouds, pierces with its glance the blue profound, and descries its almost imperceptible victim. In the same manner, in the depths of the sea, the ray ascends at the scent of a tempting bait. In that half-obscure world of doubtful and deceitful gleams, one must trust to the organ of smell, sometimes to that of touch. Those who, like the sturgeon, rake among the mud, have an exquisite prehensile sense. The shark, the ray, the cod (with its large, wide-apart eyes), see indifferently, but have a fine faculty of touch and scent. The ray's sense of smell is such that she possesses a special membrane (*voile*) to close it on occasion, and mitigate its power, which doubtlessly would weary it and strike to its brain.

To this potent appliance we must add their admirable teeth, sometimes sharpened like those of a saw, and multiplied in not a few species in several rows, so as to line the mouth, the palate, and the throat. Even the tongue is armed with them. These teeth are fine and fragile; but, behind them, others are set all ready, if they are broken, to replace them.

We have said, at the beginning of this Second Book, that it was necessary the Sea should produce a terrible progeny of all-powerful destroyers to combat and cure the strange evil which works within it—its excessive fecundity. That helpful surgeon, Death, by persevering blood-letting, mitigates the immense abundance—the plethora—with which it would otherwise be inundated. From the formidable torrent of

generation which is nourished in its depths, the deluge of herrings, the millions upon millions of the spawn of cod, which, increasing tenfold and a hundredfold, would fill the waters and choke up all Nature, the Ocean defends itself by the rapid action of that machine of Death—the armed swimmer, the Fish.

A grand spectacle is this, and an impressive one! The universal combat of Death and Love seems of little importance upon earth when we oppose it directly to that which takes place in the depths of the sea. There, waged on a scale of inconceivable grandeur, it terrifies us by its fury; but when we view it more closely, we become convinced of its true harmony and surprising equilibrium. We see that its fury is necessary; that this exchange of substance—so dazzlingly rapid!—this prodigality of death—is safety!

But no sadness; on the contrary, a wild joy seems to reign everywhere. From this ocean life, so harshly blended with two opposing forces, which seem to neutralize each other, proceeds a marvellous healthiness, an incomparable purity, a sublimely terrible beauty. It triumphs alike in the dead and the living. Without making any great difference, it lends to them and resumes from them light and electricity—draws from them that coruscation of sparks, and that infinity of pale lightnings, which even under the dark canopy of a Polar night kindles its weird and eëry illumination.

The melancholy of the Sea does not consist in the indifference with which it multiplies death, but in its impotency to reconcile progress with an excess of movement.

It is a hundred and a thousand times richer than Earth, and more rapidly fertile. Like Earth, it builds and constructs. The increase gained by Earth (as we have seen with respect to the corals) it still holds from the Sea; for the Sea is simply the Globe in labour, in its most active travail. It finds in this very rapidity its only obstacle. Its inferiority is

evident in the difficulty with which—rich as it is in generation—it organizes Love.

It saddens one to think of the millions and millions of the inhabitants of the Sea whose only love is still a vague, elementary, impersonal emotion. Those species which in due succession ascend in pilgrimage towards happiness and the light, yield up the best part of themselves—their being—to the unknown fortune. They love, and they will never know the beloved object in which their dream and their desire was incarnate. They give birth to their progeny without ever enjoying that felicity of rejuvenescence which we find in our posterity.

Few, very few—and these the fullest of life, the cruellest, and the most warlike—love after our human fashion. Yonder dangerous monsters, the shark and his mate, are forced by nature to undergo the peril of mutual caresses. A terrible, a suspicious embrace! Accustomed to devour, and, blindfold, to swallow everything—animals, timber, stones, it matters not—this time, O thing most admirable! they abstain.

However appetizing they may be for one another, they approach with their saw and their deadly teeth with impunity. The female intrepidly suffers herself to be caught and mastered by the terrible fury with which he throws out upon her. And, in fact, she is not devoured. It is she who absorbs and prevails over him. Mingled together, the furious monsters surge through the seas for week after week, unable, although famished, to submit to a divorce, to tear themselves from one another, and even in the midst of the tempest, invincible and invariable in their savage conjunction.

Some writers pretend that even when separated they still maintain their love-chase; and that the faithful shark, in his attachment to his sweet consort, follows her until she is delivered—cherishes his presumptive heir, the sole fruit of his marriage, and never, never devours it. He follows and

watches over it. Finally, if any danger lowers, this excellent father swallows his young, and shelters it in his vast throat, but *not* for the purpose of digesting it.

If the life of the Seas cherish a dream, a wish, a confused desire, it is that of fixity. The violent and tyrannical conduct of the shark, its iron grasp, its grappling with its mate, the fury of their union, give one the idea of a passion cherished by the hopeless. Who knows, in fact, if in other species of milder character and more domestic temperament this incapability of union, this endless fluctuation of an eternal but aimless voyage, may not be a cause of melancholy? These children of the Sea grow inspired with love on the shore. Many ascend the rivers, and submit to the insipidity of the poor and innutritious fresh water, to entrust to them, out of the range of the tempest, their hope of posterity. All, indeed, draw near to the coast, and seek some sinuous creek. They even become industrious, and, with sand, and mud, and herbage, essay to make their little nests. A pathetic effort! They have none of the instruments of that miracle of animal industry, the insect. They are far worse provided than the bird. It is by dint of perseverance, without hands, claws, or beak, and solely by the exertions of their miserable body, that they collect a heap of herbs, toss it and knead it, pass over it and repass, until it obtains a certain degree of cohesion. But how many circumstances fetter their efforts! The female, blind and ferocious, impedes the work and menaces the eggs. The male does not quit them, but defends and protects,—more a mother than the mother herself.

This instinct exists in several species, particularly in the humblest, as in the goby, a small fish, neither handsome nor savoury; so despised that it is not worth while to fish for it, and if caught, it is thrown back into the sea. Ah, well, this lowest of the lowest rank is a tender and laborious *pater-*

familias, which, weak and ill-provided as he is, is not the less an ingenious architect, a nest-builder, who, by his sole will and tender affection, finally succeeds in constructing the protective cradle.

It is pitiful, however, to see that such an effort of the heart does not wholly attain its end, and that this creature is arrested in its first artistic display by the fatality of its nature. One falls into a reverie; and then perceives that this world of waters is not sufficient in itself.

Great Mother, who commencest life, it is not for thee to guide it to the end! Permit thy daughter, Earth, to complete the unfinished work. Thou seest that in thy very bosom, at the most sacred moment, thy children dream of Earth and its fixedness; they approach its threshold, and render it homage.

It is for thee to begin anew the series of new creations by an unexpected prodigy, a majestic prototype of that warm amorous life, of blood, of milk, of tenderness, which shall find its full development in the terrestrial races.

CHAPTER XII.

THE WHALE.

"THE fisherman, delayed in the nights of the Northern Sea, descries an island, a reef, like the back of a mountain, towering, colossal, upon the waves. He anchors there.—The island flies, and carries him with it; for it was Leviathan."*

A very natural error, by which Dumont d'Urville was deceived. He saw from afar the breakers, with the waters eddying round them. As he approached, the white spots seemed to indicate a rock. Over the reef sported, and contended, and wheeled the sea-swallow and the bird of storms, the petrel. Above the billows rose the hoary rock, gray with limpets, shells, and madrepores. But the mass moved! And two enormous jets of water issuing from its forehead declared the aroused whale.

If the inhabitant of some other planet should descend upon ours in a balloon, and from a great elevation observe the terrestrial surface, anxious to discover whether it was peopled, he would exclaim,—

* A paraphrase of Milton's lines,—

"That sea-beast
Leviathan, which God of all his works
Created hugest that swim the ocean stream:
Him, haply, slumbering on the Norway foam,
The pilot of some small night-foundered skiff,
Deeming some island," &c.—*Paradise Lost*, Book i.

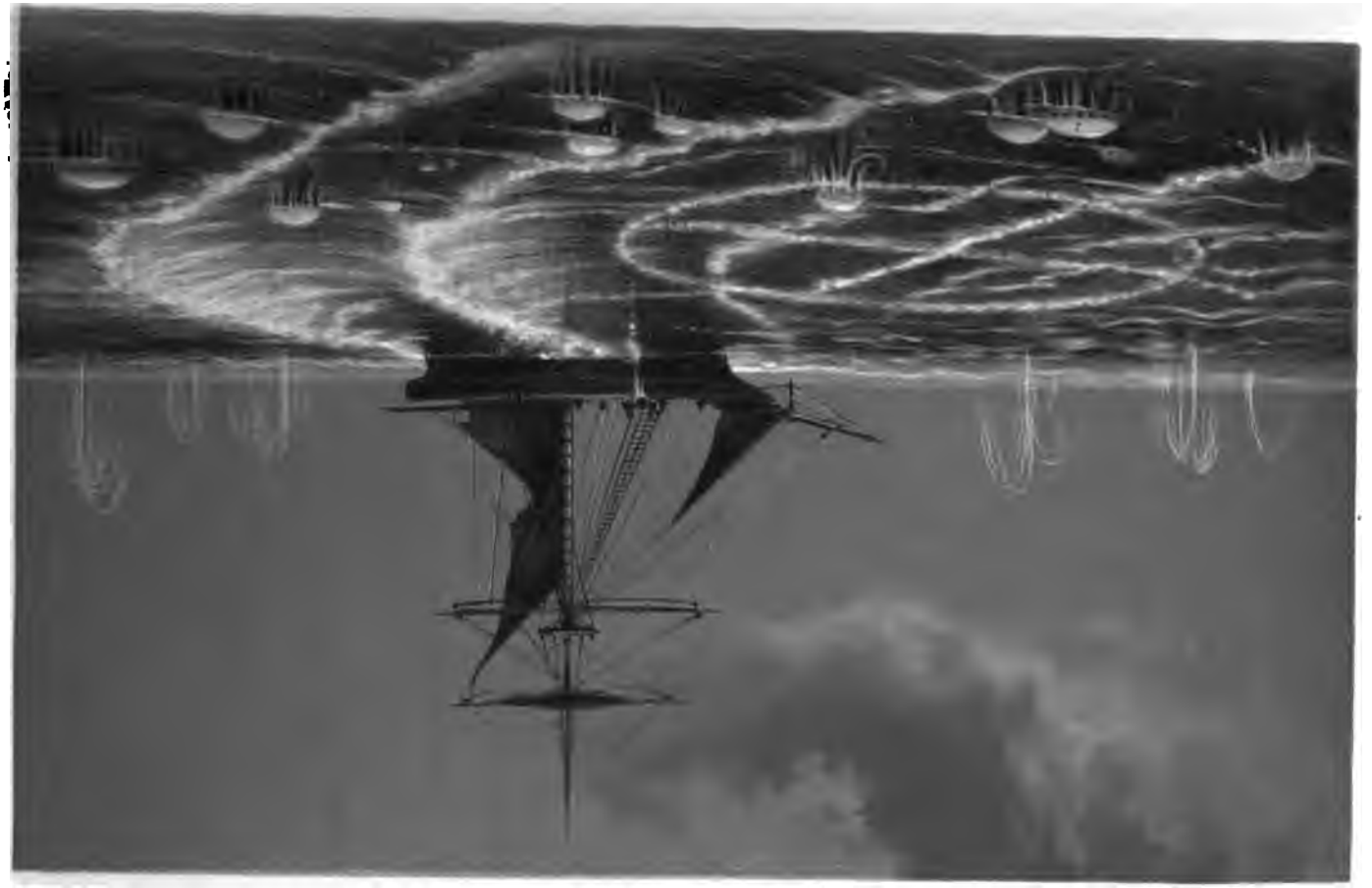
"The only beings which I can discern here are of majestic stature, from one hundred to two hundred feet in length; their arms are only twenty-four feet long; but their superb tail is thirty feet, and royally beats the sea, overmasters it, and impels them forward with a rapidity and a stately ease which reveal them very clearly as the sovereigns of the planet."

And he would add,—

"It is grievous that the solid parts of this globe should be desert, or only tenanted by animalcules too small for one to distinguish them. The sea alone is inhabited, and by a noble and genial race. Family ties are there held in honour; the mother suckles her young; and though her arms are very short, she finds means, in the tempest, to clasp her little one to her bosom, and tenderly protect it."

They come together willingly. Formerly you might see them voyaging in couples, sometimes in large families of ten or twelve, in the ocean solitudes. Nothing could be more superb than these great fleets, occasionally lit up with a phosphorescent illumination, and hurling to a height of thirty or forty feet their columns of water, which, in the Polar regions, were condensed into vapour. Calmly and curiously they drew near the voyager's vessel, eyeing it as a brother of a new species, taking pleasure in it, and festally welcoming the new-comer. In their gambols they would rear themselves erect, and then fall back their entire length, with a loud noise, and making all around them a boiling gulf. So great was their familiarity that they would even touch the ship or its boats. Imprudent was their confidence, and cruelly betrayed! In less than a century the largest species of the Balaenidae has almost entirely disappeared.

Their habits and organization are those of the herbivora. Like the ruminants, they possess a series of stomachs, in



which the food is elaborated; and as teeth are scarcely necessary to them, they have none. They graze with ease among the living pastures of the Sea, feeding upon the soft, gelantinous, and gigantic fuci, on entire strata of the infusorias, on whole banks of imperceptible atoms.

To obtain such a provision as this, there is no need to resort to the chase; and having no occasion to wage war, they have not been called upon to provide themselves with the terrific jaws and saws, the arsenal of torture and death, which the shark and so many feeble beings have acquired by dint of successive murders. They never pursue their prey. Rather, indeed, their aliment rushes towards *them*, borne onwards by the current. Innocently and peacefully they swallow a semi-organized world, which dies before it has lived, and passes asleep through this crucible of the universal change.

No true relation can exist between this gentle race of mammals, which have, as we have, blood and milk, and the monsters of a preceding age, the horrible abortions of the primeval slime. The whales, a far more recent creation, were born into a purified water, a free ocean, and a world at rest.

Having dreamed out her old discordant dream of lizard-fishes,* of flying-dragons,† the frightful kingdom of the Reptilia, Earth emerged from her sinister obscurity into the pleasant dawn of harmonious conceptions. As yet our carnivora did not exist. There prevailed a brief interval—some hundred thousand years, mayhap—of innocence and gentleness, when amiable beings made their appearance upon Earth —amiable beings like our modern marsupials, who love their family so earnestly, carry them about in their persons, and resume them, if need be, in their bosoms. In the water appeared a race of beneficent giants.

* The Ichthyosaurus platydon. † The Pterodactylus crassirostris.

The milk of Ocean, its oil, then superabounded; its warm rich animalized matter fermented with incredible vigour, and longed to develop into life. It expanded and organized itself into these colossi, these spoiled children of Nature, which she endowed with surpassing strength, and, better still, with a beautiful kindling red blood. This was now seen for the first time.

It was the true flower, the blossoming of the world. All creation possessed a pale, egoistical, languishing, comparatively vegetating blood—had the air of being without a heart—if we compare it with the generous life which seethed in this rich purple, and inspired it with love or passion. The strength of the higher world, its charm, and its beauty, were in its blood. It inaugurated a fresh youth in nature; it kindled the flame of desire; it originated love, and domestic love, and love of race, which, largely extended by man, was hereafter to crown our human life with the divine crown of Pity.

But with this magnificent gift the nervous sensibility of the animal organization is infinitely augmented. One is more vulnerable—more capable both of enjoyment and suffering. The whale being deficient in the hunter's sense of smell, nor having a keen sense of hearing, profits greatly by that of touch. The fat which protects it from the cold does not defend it from any shock. Its finely organized skin of six separate tissues, trembles and vibrates at the slightest pressure. Its tender papillae are instruments of delicate touch. And the whole is animated and vivified by a rich flow of scarlet blood, which, even if we take into account the larger stature of the whale, infinitely exceeds in abundance that of the terrestrial mammals. When the whale is wounded, the sea is immediately inundated and crimsoned for a considerable distance. The blood which trickles from us in drops, pours from it in torrents.

The female carries her young for nine months. The

pleasant-flavoured milk is somewhat saccharine, and has all the warm mildness of a woman's. But as she must incessantly cleave the waves, the mammae, placed in front upon the breast, would expose her young to every shock; they are, therefore, a little farther back, in a more protected place, and near the womb whence the young one has issued. Sheltered there, the cub profits by the already broken wave.

The ship-like form, which is a necessary condition of this ocean-life, renders the mother compact and close-girt about the middle, and precludes her possessing the graceful waist of the woman—that adorable miracle of a secure, established, and harmonious life, where everything centres in tenderness. The whale, the great ocean-woman, however gentle may be her nature, is compelled to make all her figure and structure depend on her combat with the billows. Otherwise, the internal organism hidden beneath the outer mask is exactly the same; the form is the same, the sensibility the same. A fish without; a woman within.

She is wonderfully timid. A bird sometimes terrifies her, and makes her dive so suddenly and rudely as to wound herself against the bottom.

Love, with the Balaenidae, is subjected to such difficult conditions that it requires a place of undisturbed retirement. Like the noble elephant, which shuns profane eyes, the whale seeks the desert. Their rendezvous is in the Polar regions, in the solitary creeks of Greenland, among the fogs of Behring's Straits, and, undoubtedly, also in that warmer sea which has been discovered near the very Pole. Where shall we ever find it again? We can only reach it through the horrible defiles which the ice opens up, closes, and changes every winter, as if to forbid man's return. As for the whales, it is supposed they pass under the ice, from one sea to another, by the road of shadows. A rash voyage! Forced to rise to the surface every quarter of an hour for purposes of respiration,

though they contain reservoirs of air which would suffice them a little longer, they endanger themselves greatly beneath the enormous ice-crust, pierced at rare intervals with its air-funnels. If these are not found when wanted, the ice is so hard and so thick that no force, no blows will break it, and the whale will be as surely drowned as Leander in the Hellespont. But, ignorant of the old Greek story, they boldly make the venture, and plunge beneath the waves.

The solitude is sublime. It is a strange theatre of death and silence for this festival of glowing life. A white bear, a seal, perhaps a blue fox, prudent and respectful witnesses, observe them at a secure distance. Lustres and girandoles and fantastic mirrors are not wanting. Azure crystals, spires, and aigrettes of dazzling ice, broad tracts of virgin snow, close all around them and watch in silence.

But what gives to this strange hymen its grave and touching character is the fact that it can only take place through expressed consent. They do not possess the tyrannical weapons of the shark, those hooks which overcome the feeble. On the contrary, they are separated and kept apart by their slippery fur. In spite of themselves they escape and elude one another through this most hopeless obstacle. In their grand agreement appears a seeming contention. Some whalers profess to have seen this unique spectacle. . . . .

The solitude, however, is unknown to man, and the statements to which we refer seem absurd. What is certain is, that in all things—in her love, her maternal affection, even in her self-defence—the unfortunate whale suffers from the twofold slavery of her immense weight and her difficulty of respiration. She breathes only when out of the water, and if she remains in it, suffocates. Is she then a terrestrial animal, and does she belong to the earth? Not at all. If by accident she drifts ashore, she is overcome by the enormous weight of

her flesh and fat; her organs are weighed down, and she is equally choked.

In the sole element which she can breathe, she is no less subject to asphyxia than in the non-respirable water where she lives.

Let us speak plainly. From the grand creation of the gigantic mammal issued, at the outset, an impossible being, the first poetic outcome of the creative force, which, originally aiming at the sublime, descended, by degrees, to the possible and permanent. The admirably constructed animal was endowed with every requirement, stature and strength, warm blood, sweet milk, amiable disposition. It wanted nothing but the means of life. It had been made without reference to the general proportions of the globe, without regard to the imperious law of weight. It needed in its inner structure a framework of enormous bones! Its gigantic sides were not sufficiently tenacious to keep its chest fully free and open. The moment it escaped from the hostile water it found the earth hostile also, and fell, crushed by its heavy lungs.

Its magnificent vents, and the superb column of water which it raises thirty feet, are the signs, the evidences of an infantine and still barbarous organization. In hurling it heavenwards by a powerful effort, the *blowing whale* (for such is the proper name of the genus) seems to say, "O Nature! why hast thou made me a slave?"

Its life was a problem, and it seemed impossible that the splendid but defective experiment could last. Loving, furtively and with difficulty—suckling its young to the rolling of the tempest, between the two perils of suffocation and shipwreck —the two great acts of life rendered nearly impossible, or only to be accomplished by great exertion and heroic will—what harsh conditions of existence!

The whale has never but one cub at a birth, and that is much. For she and her offspring are troubled by three circumstances; the labour of swimming, the toil of suckling, and the fatal necessity of ascending to the surface. Education? It is a constant battle! Tossed and beaten by the ocean, the cub drinks its milk as if by theft, whenever the mother can rest upon her side. In the performance of this duty her enthusiasm is admirable. She knows that in its feeble effort to suck the cub will lose its hold. In this act, while the human mother remains passive, and suffers her infant to employ its own powers, the whale is all energy. Profiting by a happy moment, and availing herself of a powerful piston, she pours out a flood of milk.

The male seldom leaves her side. Their embarrassment is grand when the fierce hunter attacks them in their offspring. The whaler harpoons the cub to compel them to follow, and they do, in truth, make incredible efforts to save and carry it off; but, ascending with it to the surface that it may breathe freely, they expose themselves to the fatal blow. When it is dead, they still defend it; and though able to escape by diving, they remain upon the waters in the midst of peril to follow the little floating carcass.

For two reasons they are frequently cast ashore. They are unable, during tempests, to remain, as fishes do, in the lower and peaceful strata of the ocean. They are also unwilling to quit one another; the strong share in the destiny of the weak, and if they perish, they perish in company.

In December 1723, at the mouth of the Elbe, eight females were wrecked (if we may use the word), and near their corpses were found eight males. In March 1784 a similar scene was witnessed at Audierne in Brittany. At first the fish and the porpoises flocked in shore, affrighted. Then was heard the sound of strange and awful bellowings,

proceeding from a great herd of whales driven headlong by the storm, but battling with it, groaning, and unwilling to die. On this occasion, too, the males perished with the females. The latter, many of whom were pregnant, being defenceless against the merciless flood, were hurled ashore, like the males, and killed by the shock.

Two, however, were delivered on the strand, crying piteously, like women in their hour of travail, and uttering heart-breaking lamentations of despair, as if they mourned for their offspring.

CHAPTER XIII.

THE SIRENS.

I LAND, and behold me now ashore. I have had enough—nay, too much—of shipwrecks. I would fain meet with enduring races. As for the cetacea, *they* are doomed to disappear. Let us lower our conceptions, and of this gigantic poesy of the first-born of the breast, milk, and warm blood, let us preserve everything—except the giant.

Especially let us preserve its softness, its family love and tenderness. Let us carefully cherish these divine gifts in the humbler but gentle races, wherein the two elements have mingled their spirit.

The benedictions of earth already make their influence felt. On abandoning the life of the fish, many things which to the fish are unattainable are readily harmonized.

Thus the whale, as a tender mother, knew all the luxury of love's embrace, and tenderly clasped her infant, yet could not press it to her bosom; her arm was placed too high, and the bosom in that living vessel must necessarily be in the rear. But among the new beings which now make their appearance, and which not only swim but also creep along the earth—such as the walrus, the lamantin, the seal—the breasts, that they may not impede their movements, are brought forward to the bosom. Thus we come to see a foreshadowing

of Woman; of a form and a graceful attitude which enchant us in the distance.

In reality, when closely inspected, we perceive that, with less whiteness and less charm, it is nevertheless the feminine bosom; that globe which, swelling with love, and the sweet necessity of suckling, reproduces in its movements all the sighs of the heart that throbs beneath. It repossesses itself of the infant to carry it, feed it, and hush it to repose. This happiness was denied to the mother which swam in the waters, but is granted to her who rests herself on land. The permanency of household ties; the spirit of domestic tenderness, more deeply felt, and increasing in intensity daily; nay more, let us say, Society itself;—all these grand realities began when the infant first slept upon its mother's bosom.

But how was the transition accomplished from the cetacea to the amphibia? Let us attempt to define it.

Their relationship at the outset is evident. Though now amphibious, they still drag along, to their great disadvantage, the unwieldy tail of the whale. And the latter, at least in one species, contains in its tail the outline and distinct commencement of the two hind feet, which we shall find developed in the higher amphibia.

In seas besprinkled with islands, and everywhere intersected by the land, the cetacea, being continually interrupted in their course, would necessarily modify their habits. Their less rapid movements and their captive existence would diminish their stature, reducing it from that of the whale to the proportions of the elephant. The sea-elephant then appeared. Retaining a recollection of the superb tusks which had armed certain species of the cetacea in their great marine career, it still exhibits in the front of its jaw a couple of strong but comparatively inoffensive teeth. Even the masticators are neither purely herbivorous nor purely carnivorous.

They are not very effective for either *régime*, and accomplish their task but slowly.

Two things lightened the whale: its mass of oil, which floated it on the water; and its powerful tail, which, by striking the water alternately right and left, propelled it forward. But these burdens overwhelm the amphibia, which paddles in shallow water, and climbs the rocks, like an enormous snail. The nimble fish laughs at the ungainly creature, which cannot pounce upon its prey; which can only capture the mollusc, as slow and awkward as itself. By degrees it accustoms itself to feed upon the plentiful gelatinous fuci, which nourish and fatten without giving the vigour derivable from animal food.

Thus in the Red Sea, and in the waters of Melanesia and Australia, that rare colossus, the dugong, which rears above the wave its breasts and bosom, sits or drags itself along. It is sometimes named "the dugong of the tabernacles;" an inert idol, imposing in appearance, but rarely defending itself; which will soon disappear and return into the domain of fable, among those authentic legends we so stolidly laugh at.

What has accomplished this surprising change, created this terrestrial cetacea, the dugong, and its brother, the walrus? The mild nature of the earth, which before the advent of man was so full of peace—the attraction of vegetable food, which is not able to fly away like that of ocean—and also, without doubt, the influence of love, which, ever difficult to the whale, is easily cultivated in the reposeful life of the amphibia.

Love is no longer the creature of chance. The female no longer that haughty giant which must be pursued to the very end of the earth. She rests submissively among the undulating sea-weeds to obey her lord. She renders up to him a soft and tender existence. There are few mysteries in their amours, for the amphibia live openly in the sun. And the females, being very numerous, press about their master and provide

him with a seraglio. From an existence of wild romance we suddenly descend to the commonplace, or, if you like, patriarchal customs of over-easy pleasures. He, the good patriarch, respectable with his robust head, his moustaches, and his tusks, sits enthroned between Hagar and Sara, Rebecca and Leah, whom he loves ardently, as well as his children, which cluster round him in a small herd. In his uneventful life, the living energy of this sanguineous creature expends itself wholly in domestic tenderness. He embraces his loved ones with a tender, proud, and choleric affection. For their sake he becomes a hero, and is willing to die. Alas, his strength and fury avail him little! His enormous mass delivers him up to the enemy. He roars, he drags his huge bulk along—the gigantic abortion! he would fain fight, but he cannot—and, lost between two worlds, the poor disarmed Caliban perishes!

The weight which is fatal to the whale proves yet more dangerous to these amphibia. Let us then shorten their stature, lighten their colossal fat, make their spine supple, suppress, above all, their monstrous tail, or rather divide it into two fleshy appendages which may prove of far greater utility. The new being thus created, the seal, being much lighter, a good swimmer, a good fisher, living in the sea, but enjoying its loves on earth (its little paradise), will spend its life in constant effort to return thither, to ascend the rocks where its mate and its young invite it, and where it supplies them with their daily food. Carrying its prey in its mouth, and lacking the tusks which assist the walrus to climb, it brings into play its anterior and posterior limbs, clinging to the sea-wrack, extending and dividing each as far as it possibly can, and in such wise that, gradually becoming ramified, the fore-feet are in time provided with five fingers.

A beautiful feature in the seal, and one which immediately

strikes the spectator, is its capacious brain. No being, except man, is distinguished by so great a cerebral development. The impression it produces is much stronger than that of the ape, towards whose grimaces we cherish a decided antipathy. I shall always remember the seals in the Zoological Gardens of Amsterdam; that attractive, rich, and admirably organized museum, one of the charming places of the earth. It was on the 12th of July, after a storm of rain; the air was heavy; two seals, gambolling and swimming, were seeking coolness at the bottom of their pond. When they rested, they peered at the spectator with a look of intelligence and sympathy, and fixed upon me their soft, velvety eyes. There was something mournful in their gaze. An interpreting tongue was wanting both to them and to me. We were unable to remove our eyes from one another. We regretted that there existed between soul and soul this insurmountable barrier.

The earth is their heart's home; they are born there, and they love it; and when wounded, they return thither to die. There, too, they lead their pregnant females, couching them upon sea-weed, and nourishing them with fish. They are kindly and generous neighbours, and readily hasten to each other's defence. Only in their season of love they grow frenzied and engage in furious strife. Each has three or four spouses, whom he establishes ashore on a massy rock of sufficient extent. It is his own domain, in which he suffers no intruder, teaching every one to respect his right of occupation. The females are mild-tempered and have no tusks. When hurt, they burst into tears, and rock themselves piteously to and fro with glances of despair.

They carry their young for nine months, and watch over them for five or six, teaching them to swim, to fish, and to select suitable food. They would tend them for a longer period, if the husband did not grow jealous; but he drives

them away from his settlement, fearing lest the too feeble mother should provide him with an unexpected rival.

This brief training has in all probability limited the progress which the seals have made. Maternity is only complete among the lamantins, an excellent race, where the parents have not the courage to expel their young. The mother watches over them for a considerable period. When a second time pregnant and suckling another infant, she may be seen with her eldest born at her side; and this young male is never ill-treated by the father, who dearly loves him, and leaves him to the maternal care.

This extreme tenderness, which is peculiar to the lamantins, is expressed in their organization by a well-defined physical progress. In the seal as a great swimmer, and in the unwieldy sea-elephant, the arm remains a fin. It is held close-set to the body, and cannot disengage itself. At length the female lamantin, a remarkably gentle and amphibious *woman*, the *mama di l'eau*, or water-mother, as our negroes call her, accomplishes the miracle, and by a continual effort succeeds in releasing herself. Nature is stirred to invention by the ever-present idea of caressing and close-clasping her infant birth. The ligaments yield and stretch, and suffer the fore-arm to go forward, and from this arm radiates a palmated polypus—the hand!

Then, indeed, the lamantin enjoys the supreme happiness of caressing her young with her hand to hold it to her bosom. She seizes it, and lays it upon her heart.

Behold, then, two distinctive features which elevate these amphibia to a high position in the scale of animated nature:—

They possess *the hand*, the organ of industry, and the essential instrument of the work that must hereafter be done. Let it grow more supple, and assist the teeth, as in the

beaver, and art will commence; the art, at the outset, of sheltering the family.

On the other hand, education has become possible. The infant, cradled on its mother's bosom, and slowly imbibing her life, remaining long by her side at an age when it is able to learn; all this results from the goodness of the father, who protects his innocent rival. And it is this circumstance which permits of progress.

If one may believe certain traditions, the progress was continuous. The amphibia having developed and approximated to the human form, became half-men, men of the sea, tritons or sirens. Only, contrary to the melodious sirens of Greek fable, these remained dumb, powerless to create a language, to converse with man, to obtain his pity. All such races have perished, even as nowadays we see the unfortunate beaver perishing, who cannot speak, but who weeps.

It has been lightly said that these strange figures were seals. But how could men deceive themselves? The seal was well known to the ancients in all its varieties. In the seventh century, at the epoch of St. Columba, they hunted it, sold and eat its flesh.

The mermen and the mermaidens, of whom we hear in the sixteenth century, were seen, not for a moment on the water, but on land, being publicly shown and bred in the great centres of Anvers and Amsterdam, to Charles V. and Philip II., and afterwards to Vesalius, and other leading men of science. Mention is made of a marine woman who lived many years in the habit of a nun, in a convent where everybody could see her. She did not speak, but worked and knitted. Only she could never conquer her love of the water, and made every effort to return thither.

The reader will object: If these creatures really existed, why were they so rare? Alas, we need not seek very far for

THE CHASE OF CHEER FAWN

the answer. It is because, as a general rule, they were slain. Who suffered them to live committed a crime, "for they were *monsters*." Such is the usual phrase in the old narratives.

Every creature which did not wear the well-known forms of animality, but which, on the contrary, approximated to those of man, was then stigmatized as *monstrous*, and straightway massacred. The unfortunate mother who brought a deformed child into the world was unable to protect him; he was suffocated under a mattress. Men believed him to be a son of the devil, an invention of his malice designed to insult creation and calumniate God. Consequently, these Sirenidae, with their strong resemblance to man, were all the more readily looked upon as a Satanic invention. The Middle Ages held them in such horror that their appearances were included among the frightful prodigies which God in his wrath permits to terrify the sinner. Men scarcely ventured to touch them. They made all haste to extirpate them. Even the bold sixteenth century thought they were "devils in the guise of humanity," which should only be touched with an harpoon. They had become very scarce when miscreants bethought themselves of training and exhibiting them as a speculation.

But, at all events, there will remain some bones, some fragments? This we shall know when the museums of Europe undertake a complete exposition of their immense treasures. A place is wanting, I know well, and will always be wanting, if we require for this purpose a palace. But the simplest shelter, a vast and inexpensive roof, would suffice for the display of things so solid. Until then, we see only selections and a few choice specimens.

Let us add that the exhibition of stuffed amphibia, to be truthful, ought to present these monsters with their fatal likeness to man, in the situations and the attitudes which originally produced the illusion. Let us leave them that

honour; they have paid dearly for it. Let the mother seal or the mother lamantin appear before me on her rock, like an ancient siren, in the first employment of the hand and the breasts, clasping her infant to her bosom.

Does this mean that such beings could ever have attained to our human standard? Am I asserting that they were the authors, the forefathers of man? Mallet thought so; but for myself, I do not see any probability in the hypothesis.

All life, undoubtedly, originated in the Sea. But it is not from the highest animals of the Ocean that that parallel series of terrestrial forms took its start, of which Man is the crown. They were already too definitively established, too specific, to furnish the mould of a nature so entirely different. They had pushed too far, and had almost exhausted, the fecundity of their species. Under these circumstances the eldest perished; and it is low down the ladder, among the obscure younger offshoots of some cognate class, that the new series arose, which was to attain so noble an elevation.

Man was not their son, but their brother; and a brother filled with cruel enmity.

Behold him now arrived, the strong of the strong, the ingenious, the active, the cruel lord of the world. My book is flooded with light. But will he too rise higher? Ah, how many sorrowful things will this very light reveal to me!

This creator, this tyrannical deity, has made a second nature in nature. But what has he done with the other, the primeval, his mother and nurse? With the teeth which she gave him he has gnawed her heart.

How many animals which lived tranquilly, grew humanized, and inaugurated the arts, are, nowadays, wanderers and brutalized—are, in fact, beasts! The king-apes of Ceylon, whose wisdom was famous throughout India, have become

frightful savages. The brahmin of creation, the elephant, hunted and subjugated, is simply a beast of burden.

The freest of living creatures which formerly roamed the deep—the gentle seals and pacific whales, the laudable pride of Ocean—have fled to the Polar Seas, the terrible world of ice. But as all are not able to withstand so severe an existence, they too, after a brief period, will wholly disappear.

An unfortunate race, that of the Polish peasants, have felt in their heart the emotion and the intelligence of the mute exile which has taken refuge among the lakes of Lithuania. They say, "Whoever makes the beaver weep, will never thrive!"

The artist has become a timid beast, which no longer knows or can accomplish aught. Those of his kind who still survive in America, ever retiring and fleeing further, have lost their courage, and attempt no important labours. A traveller recently met with one which, far away towards the upper lakes, had timidly resumed its natural task—was building an asylum for its family, and cutting timber. When it caught sight of the intruder the wood slipped from its grasp, it could not attempt to escape, but burst into tears!

BOOK III.

THE CONQUEST OF THE SEA.

Who the great secret of the deep possessed,
And, issuing through the portals of the West,
Fearless, resolved, with every sail unfurled,
Planted their standards on the Unknown World.

SAMUEL ROGERS.

BOOK III.

THE CONQUEST OF THE SEA.

CHAPTER I.

THE HARPOON.

"THE mariner who arrives in sight of Greenland," (says Sir John Ross, with frank simplicity,) "can feel no pleasure in the aspect of its shore." I thoroughly believe it. It is an iron coast of pitiless aspect, whose black precipitous granite even throws off the very snow. Everywhere is ice. There blooms no vegetation. That desolate region, which hides from us the Pole, seems a land of death and famine.

During the brief interval that water does not freeze, one may nevertheless contrive to live there. But this is only three months out of twelve, and during the remaining nine months what is man to do?—what is he to eat? He cannot go in quest of any food. Night lasts for many months, and sometimes is so profound, that Dr. Kane, though surrounded by his dogs, could only discover them by their hurried breath.

In this prolonged season of shadow, on this hopeless and barren land, clothed with impenetrable ice, wander still a

couple of solitaries who persist in living there, surrounded by all the horrors of an impossible world. One of them is the fishing bear, a keen prowler, with his luxuriant fur, and his thick coat of fat, which enables him to endure long intervals of privation. The other, a fantastic figure, has the appearance, when seen afar off, of a fish standing erect upon its tail—an ill-shaped and ungainly fish, with long pendent fins. But this pseudo-fish is—Man. They scent and they hunt one another. They are both hungry. The bear, however, sometimes takes to flight, and declines the combat, recognizing in his adversary a being more cruelly hungry and more ferocious than himself.

Man, when an-hungered, is terrible! Armed with nothing but a fish-bone, he pursues this enormous beast. Yet he must have perished a hundred times if he had had no other prey than his formidable companion. It is through a crime that his life has been preserved. Earth yielding nought, he has turned to the Sea, and as it was bound in fetters of ice, has found no creature to kill but the friendly seal. And in him he has obtained the fat of the Sea, the oil, without which he must have died of cold, if not of hunger.

It is the dream of the Greenlander that at death he passes into the moon, where he finds fuel, and fire, and the radiant hearth. Here upon earth oil is his substitute for these joys. Drunk in large quantities, it warms him.

A great contrast prevails between man and the somnolent amphibia, which know, even in this rigid climate, how to live without any extreme suffering. This may be plainly seen in the seal's mild eye. Nursed by the Sea, he is always in intimate relations with her, and by means of the cracks and chinks of the ice, he supplies himself with food. Unwieldy as one might think him, he nimbly mounts on a block of ice, and makes it carry him. The dense molluscous water, rich with living atoms, fattens the fish for the after-profit of the seal,

which, after banqueting heartily, sleeps upon its rock the heavy sleep that nothing can disturb.

Wholly different is the life of man. He appears to dwell upon the ice-bound shore in defiance of God, as a being accursed, and everything wars against him. In the photographs we receive of the Eskimo, we may read his terrible destiny in the fixedness of his gaze, in his cold dark eye, gloomy as night. He seems petrified by a vision, by the spectacle of an infinite melancholy. Nature, with its eternal terror, has concealed under a vizor of brass his vigorous intelligence, which is still prompt and rapid, and full of expedients for coping with the unforeseen dangers of his strange existence.

What could he do? His family were hungry, and his children cried; his pregnant wife shivered in the snow. The Polar wind incessantly deluged them with hail, with a whirlwind of keen arrows which enter and wound the body, stupify the senses, and deprive the sufferer of voice and understanding. When the ice shuts up the Sea, there is no more fish. But the seal is there; and in a single seal how many fish and what a wealth of oil are accumulated! It lies asleep and defenceless, and even when aroused, makes no attempt to fly. It suffers its hunter to approach and touch it. Like the lamantin, if you would drive it away you must overwhelm it with blows. Seals that have been caught when young, follow you so obstinately that you must fling them back into the sea. Such docility and tameness at first embarrass man, and he hesitates, struggling with temptation. But at length the cold proves irresistible, and he descends to massacre. Thenceforth he grows rich, and lives.

The flesh nourishes the starved. The oil, absorbed in abundance, warms them. The bones serve a thousand domestic purposes. The fibres are woven into thread and cordage. The skin, cut to fit a woman's stature, covers her shivering

body. The same style of garment suffices for both of them, except that the woman's is somewhat longer, and is gaily adorned with a border of red leather to please the man's eye and attract his love. But what proves of far greater utility is the light but strong machine, industriously contrived with close-sewn skins, in which the intrepid Greenlander embarks, and which he calls a boat.

A wretchedly long and frail affair, weighing scarcely anything! It is carefully closed on every side, except at the hole where the rower sits, gathering the skin around his waist. You would be readily disposed to wager that it would upset. But no; it darts like an arrow over the back of a wave, disappears and reappears in the violent and tossing eddies which swirl round the floating icebergs.

Man and canoe are one. The whole is an artificial fish. But how inferior to the true one! It lacks the apparatus, the natatory bladder which support the other, and render it at will either light or heavy. It wants the oil which, lighter than water, tends always to rise to, and float upon, the surface. Above all, it is deficient in that peculiarity which, in the true fish, is the secret of its vigorous motions, the quick contraction of the spine acting upon the strong and ready tail. Man only imitates, and that feebly, the fish's fins. His oars, however, which are not close-set to the body, but moved at a convenient distance by the long human arm, are comparatively very soft, and very easily fatigued. What provides against all these disadvantages? Man's terrible energy; and under this fixed mask his vivid reason, which, from minute to minute, and by fits and starts, decides, and invents, and discovers, and incessantly seeks a remedy against the perils of the floating skin which is his sole defence against death.

Frequently his onward course is arrested by a barrier of ice. Then the parts are changed. The boat bore the man, and now the man bears the boat; and carrying it on his shoulder,

he traverses the crackling ice-field, and launches it at a convenient spot. Sometimes the floating mountains draw close together, leaving between them only a narrow corridor, which suddenly opens and shuts. In this he may disappear, and find a living tomb! He may watch, moment after moment, the approximation of the two azure-tinted walls, which fall in upon him and his boat with so awful a pressure that he is flattened to the thinness of a hair! Such a fate once befell a large vessel. She was cut in twain, and each half crushed as flat as a plank.

The Eskimos assert that their fathers hunted the whale. Less miserable then, their land was less cold; they were more inventive, and probably made use of iron tools—the iron being imported from Norway or Iceland. Whales have always superabounded in the Greenland Seas, and have ever been lusted after by those with whom oil is the first of wants. The fish yields it in drops, the seal in floods, the whale in mountains.

Truly a real, a genuine man, was he who first adventured on such an enterprise; who, in a frail boat, with indifferent weapons, and the sea groaning under his feet, in the shadow and among the ice, face to face, joined battle with the colossus.

He who so trusted himself to his strength and his courage, to the energy of his arm, the directness of his aim, the weight of his harpoon. He who believed it possible to pierce the skin, and the wall of fat, and the thick flesh.

He who did not fear lest at its terrible awakening, and in the storm which the wounded giant brews with its wild bounds and convulsive throes, he might be engulfed with it. Climax of audacity! he added a cable to his harpoon that he might follow up his prey, and he braved the terrific shock, heedless that the affrighted beast might suddenly descend, and take refuge in the depths.

There was yet another danger. This: that instead of the whale, he might find in its place the whale's enemy, the terror of the Sea, the cachalot. It is no colossus, not measuring more than from sixty to eighty feet. And of its entire length its head occupies fully one-third, twenty to twenty-five feet. In such an event, woe to the fisherman! It is he who becomes the fish, the prey of the monster. The latter has eighty enormous teeth, and horrible jaws, capable of devouring everything, man and bark. It seems drunk with blood. Its blind wrath terrifies all the cetacea, which flee before it roaring, rush ashore, and conceal themselves in the sand or mud. Even when it is dead they fear it, and durst not approach its carcass. The wildest species of the cachalot is the orc, or the physetera of the ancients; so much dreaded by the Icelanders, that they tremble to name it when at sea for fear it should hear and pursue them. They believe, on the contrary, that one species of whale, the jubarta, loves and protects them, and provokes the monster in order to save them from becoming its prey.

Many writers affirm that the first men who confronted so perilous a hazard were necessarily of a fiery temperament, wild and headstrong spirits. Such an enterprise, according to them, could never have been undertaken by the prudent sons of the North, but by our Basques, the very heroes of fantasy. Terrible climbers, the hunters of Mont Perdu,* and all-daring fishers, they scoured in their frail boats the capricious waters of the Gulf or Bay of Gascony. There they captured the tunny. There they discovered the gambolling whales, and started in pursuit of them as eagerly as they hunted the wild

* Mont Perdu, one of the Pyrenean peaks, attains the elevation of 10,994 feet. The Basques are a strange wild race, capable of great endurance—hardy seamen, daring hunters. They pursue their game into the most frightful recesses of the Pyrenees. As fishermen, they dare the stormiest waters, and are equally distinguished by their courage and success. They have at all times furnished Spain with her best seamen.

goat among the bogs, the chasms, and frightful precipices of the Pyrenees. This enormous game—enormously tempting in size, and in chance and peril—they hunted to the death, and recked not whither it conducted them. Without taking note of their course, they advanced to the Pole.

There the poor giant thought it would have escaped them, and not supposing, doubtlessly, that any men would be so mad as to venture further, lay tranquilly asleep, when our imprudent heroes noiselessly approached.

Tightening his red belt, the strongest and most agile leapt from the bark, and into the mighty mass, without thought of life, and, with a loud *hurrah!* plunged his harpoon.

CHAPTER II.

DISCOVERY OF THE THREE OCEANS.

WHO opened up to men the great navigation? Who revealed the Sea, and tracked out its zones and highways? Finally, who discovered the globe? We answer—the Whale and the Whaler.

And this, prior to the epoch of Columbus and the famous Gold-Hunters, who obtained all the glory, *re*-discovering with a flourish of trumpets what the fishermen had already discovered.

The passage of the Ocean, which was so loudly celebrated in the fifteenth century, was often achieved by way of Iceland and Greenland, and even by the open sea; for the Basques visited Newfoundland. The voyage was an insignificant danger for men who went to the end of the world in quest of that supreme peril—the battle with the whale. To penetrate into the Northern waters, to confront openly the living mountain in the depth of night, and, so to say, in ever-present risk of shipwreck, with their foot planted on the whale and the abyss beneath;—men who could dare such perils were men of intrepid hearts, and might well regard with indifference the ordinary phases of the Ocean.

It was a noble war, and a grand school for courage. Whale-fishing was not then, as it is to-day, an easy carnage, which can be prudently conducted from a distance, and with

a machine; the fishers struck with their own hands, risked life for life. They killed few whales, but they gained infinitely in maritime skill, in patience, in sagacity, in intrepidity. They brought back less oil and more glory.

On this field of rivalry each nation displayed its peculiar genius. One might recognize them by their different mode of procedure. There are a hundred forms of courage, and their graduated varieties were like a gamut of heroism. To the North belonged the Scandinavian, the fair and ruddy races of Norway, Germany, and Flanders, with their sanguine fury. To the South, the dash of the Basque, and the splendid madness which guided him so triumphantly around the world. To Central Europe, the firmness of the Breton, silent and patient, but in the hour of danger sublimely extravagant! Finally, the wisdom of the Norman, armed with the faculty of association, with ever-ready foresight, and calculated courage, —prompt to brave all things, but only for success. Such was the high beauty of man in this supreme manifestation of human courage.

We owe much to the whale; but for *it* our fishers would have clung close to the shore, for nearly every fish inhabits the river: it is the whale which emancipated them, and led them all over the world. They were drawn by an irresistible fascination out into the open sea, and ever pursuing their prey, ventured from one point to another, until, without being aware of it, they found they had passed from the Old World into the New.

The Northern Ocean then was less encumbered with ice, and they affirm that they touched the Pole, or at least arrived within a distance of seven leagues of it. Greenland did not attract them; for it was not land they were in search of, but the Sea, and the track of the whale. The wide Ocean is its home, and it is there it wanders, especially out in the open.

Each species prefers a certain latitude, a belt of water of varying temperature; and in this manner came to be distinguished the great divisions of the Atlantic.

The crowd of inferior whales, distinguished by a fin upon their back, the Balaenoptera, are found at the extremes of heat and cold, under the Equator and in the Polar Seas.

In the vast intermediate region the ferocious cachalot resorts to the southward, and devastates the warmer waters.

On the other hand, the common whale (the right or Greenland) dreads them, or rather *did* once dread them, for it is nowadays very rare! Principally feeding upon molluscs, and other rudimentary organisms, it sought them in the temperate waters a little to the northward. It was never met with in the hot southern current; a circumstance which led to the discovery of that current, and of *the true highway from America to Europe.* From Europe to America we are propelled by the Trade Winds.

If the common whale has this horror of the genial Tropic waters, and cannot pass the Equator, it is necessarily unable to double America. How, then, does it happen that a whale wounded in our hemisphere, in the Atlantic, is sometimes met with in the other hemisphere, between Asia and America? *Because a passage exists to the north*—a second discovery! a vivid light thrown upon the form of the globe and the geography of the Seas.

From point to point the whale has guided man around the globe. As it has now become very scarce, we are compelled to grope for it about the two Poles, in the extreme angle of the Pacific at Behring's Straits, and in the vast Antarctic waters. There extends beyond the southern promontories of America and Africa an immense region never traversed by our armadas or our commercial navies. None ever visit it but the whalers.

If man had desired it, he might have achieved at a much

earlier epoch the great discoveries of the fifteenth century. He had only to address himself to the sea-rovers, the Basques, the Icelanders or Norwegians, or our Normans. For various reasons he mistrusted them. The Portuguese would only employ their own seamen, and the school which they themselves had trained. They feared our Normans, whom they attacked and expelled from the African coast. On the other hand, the kings of Castile always regarded with a degree of suspicion their Basque subjects, whose privileges secured them a kind of republican independence, and who, moreover, were supposed to be dangerous and untameable spirits. It was thus that these princes failed in more than one enterprise. We will refer only to that of the Invincible Armada. Philip II. had two experienced and veteran Basque admirals in his service, but he gave the command to a Castilian. He acted in opposition to their counsel, and the result was the great disaster.

A terrible malady had broken out in the fifteenth century —the hunger, the thirst, the all-consuming desire of gold. Kings and peoples wept for gold. There was no other means of restoring a balance between expenditure and income. Counterfeit coinage, cruel trials, and atrocious wars—all these had been resorted to, and still, no gold! The alchemists promised it should be forthcoming in a brief period; but men must wait. The exchequer, like a lion furious with hunger, eat up the Jews and devoured the Saracens, and of this rich nourishment not a scrap remained.

It was the same with the people. Lean, and wasted to the bone, they demanded, they implored a miracle which should bring them gold from heaven.

Everybody knows the fine story of Sinbad in the "Thousand and One Nights,"—an ever true story which is constantly being repeated. The poor labourer, Hindbad, as he totters

along the street, with a heavy load of wood upon his shoulders, hears the concerts and the revelry in the palace of Sinbad, the great rich traveller. He contrasts their conditions in a spirit of envy. But the other then relates to him all he has suffered in his search after gold. Hindbad is terrified by the recital. The effect of the tale is to exaggerate the perils, but also the profits, of this grand lottery of travel, and to discourage sedentary labour.

The legend which, in the fifteenth century, inflamed every brain, was a new version of the fable of the Hesperides—El Dorado, a land of gold, which was placed in the Indies, and was supposed to be the terrestrial paradise, always flourishing in this lower world. The minds of men could think of nothing but its discovery. It was useless to seek it in the North. This was the reason so little profit was derived from the discovery of Greenland and Newfoundland. Southward, on the contrary, gold dust had already been found in Africa, an encouraging circumstance.

The dreamers and scholars of a pedantic age accumulated, and commented upon, the ancient texts, until the discovery, of no difficulty in itself, was rendered difficult by dint of lectures, reflections, and chimerical Utopias. Was or was not this Land of Gold the true Paradise? Was it situated at our Antipodes? And had we any Antipodes? At this word, the black-gowned priests and doctors stopped the men of science, and reminded them that on this point the doctrine of the Church was explicit, the heresy of the Antipodes having been expressly condemned.

Here was a grave difficulty, and inquiry was suddenly arrested.

Why, then, was America, which had already been discovered, so difficult to discover? Because men at once longed and feared to find it.

The sagacious Italian bookseller, Christopher Columbus,

thoroughly knew his business. He had visited Iceland and collected its traditions, and the Basques had also communicated to him all they knew about Newfoundland. A Galician had been cast ashore, and had resided there. Columbus selected for his companions some pilots settled in Andalusia, the Pinzons, who are believed to be of the same family as the Pinçons of Dieppe.

And this is very probable, for our Normans and the Basques, subjects of the Castilian monarchs, maintained a very intimate relationship. It was the latter who, under the name of Castilians, and led by the Norman Béthencourt, made the celebrated expedition to the Canary Islands. The French kings accorded certain privileges to the *Castilians* established at Honfleur and Dieppe; and, on the other hand, the men of Dieppe had their factories at Seville. It is not certain that a Dieppese discovered America four years before Columbus; but it is almost certain that these Andalusian Pinzons were Norman privateers.

Neither Basques nor Normans could, in their own names, have obtained an authorization from the kings of Castile. For this an able and eloquent Italian was needed, a persevering Genoese, who resolutely followed up his idea for fifteen years, who recognized the felicitous moment, seized the opportunity, and skilfully swept aside every objection. The moment came, when the ruin of the Moors cost Castile so dear, and the cry rose louder and louder: "Gold, gold!" The moment came, when victorious Spain reeled with its strife of crusade and inquisition. The Italian, a devotee among devotees, seized this lever. He acted through the Church itself: he excited Isabella's scruples at leaving so many heathen nations in the shadow of death. He demonstrated to her clearly that to discover the Land of Gold was at the same time to exterminate the Turk and regain possession of Jerusalem.

We know that out of three ships the Pinzons furnished two, and undertook their command. They started in advance. One of them, it is true, was mistaken; but the other, Francisco Pinzon, who was accompanied by his younger brother Vincenzio, pilot of the ship *Nina*, signalled to Columbus that he must follow them to the north-west (October 12, 1492). Columbus, steering directly westward, had encountered the full force of the hot current which flows from the Antilles to Europe. He could only have traversed the liquid wall with extreme difficulty. He must either have perished, or have progressed so slowly that his crew would have revolted. On the contrary, the Pinzons, who, it is possible, were guided by some old traditions, navigated as if they were acquainted with this current; they did not face it at its issue, but, bearing to the south, passed it without trouble, and approached the very place where the Trade Winds propel the waters of Africa towards America, in the latitude of San Domingo.

This is proved by Columbus's own journal, which frankly acknowledges that the Pinzons directed him.

Who first saw America? One of Pinzon's mariners, if we may trust the decision of the royal commission in 1513.

It would seem that under such conditions a large part of the gain and the glory ought to have been theirs. And so they pleaded. But the king decided in favour of Columbus. Why? Because, in all probability, the Pinzons were Normans, and Spain preferred to recognize the claim of a Genoese, without a settlement and without a country, to that of the French, the great rival nation, the subjects of Louis XII. and Francis I., who might some day have been able to transfer their rights to their masters. One of the Pinzons died broken-hearted.

But, from another point of view, who had removed the great obstacle of religious repugnance? Who, with such eloquence, skill, and perseverance, had secured the equipment

of the expedition? Columbus—only Columbus. He was the true author of the enterprise, and he was also its heroic conductor. He merits the glory which he preserves with posterity.

I believe with M. Jules de Blosseville—a noble spirit, and a fitting judge of great deeds—I believe that there was really nothing arduous in these discoveries but the circumnavigation of the world, the enterprise of Magellan and his pilot, the Basque, Sebastian del Cano.

The easiest and most brilliant had been the passage of the Atlantic, under the favourable breath of the Trade Winds —the falling in with America, which already had been long ago discovered in its Northern regions.

The Portuguese accomplished a far less extraordinary feat in devoting an entire century to the discovery of the west coast of Africa. Our Normans, in less time, would have explored half the continent. Despite all that has been said respecting the school of Lisbon, and the admirable perseverance of Prince Henry who created it, the Venetian Cadamosto shows in his narrative that the Portuguese pilots possessed but little ability. As soon as they had the fortune to meet with one who was a man both of genius and courage—Bartholomew Diaz, who doubled the Cape of Good Hope—they replaced him by Vasco de Gama, a great lord of the royal house, and, before all things, a warrior. They were more preoccupied with making conquests and amassing treasures than with discoveries, properly so called. Gama was renowned for his brilliant valour; but he proved himself too faithful in obeying the orders he had received to suffer no intruders in the Indian Seas. A vessel carrying a body of pilgrims to Mecca, with all their families, was seized by him, and every one on board was massacred; an event which exasperated the Moslem's hatred of "the infidel," increased throughout the Orient the horror with

which the name of Christian was regarded, and closed the gates of Asia.

Is it true that Magellan had seen the Pacific laid down on a globe by the German Boehm? No; it does not appear so from the globe which is still extant. May he have seen in the possession of his master, the King of Portugal, any chart on which it was indicated? This has been asserted, but not proved. It is much more probable that the adventurers who, prior to Magellan's voyage, had already, for a score of years, overrun the American continent, had seen with their own eyes the great Southern Sea. The report of it which was then noised abroad wonderfully agreed with the idea suggested by mathematical calculation, that such a counterpoise was necessary to the hemisphere we inhabit and to the equilibrium of the globe.

No life more terrible than Magellan's is on record. All is battle, distant voyages, flights and trials, shipwrecks, attempted assassination, and, finally, death at the hands of savages. He fights in Africa. He fights, too, in the Indies. He marries among the brave and ferocious Malays, whom he seems to have resembled.

During his long residence in Asia, he collects every fact he can hear of, prepares his great expedition, his attempted voyage by way of America to the islands of spices, the Moluccas. If one purchased them at the place of their growth, one was sure to obtain them at a lower rate than when procuring them from Western India. The enterprise, as originally conceived by him, was therefore purely commercial. An increased profit upon pepper was the inspiration of the most heroical voyage ever undertaken upon this planet.

Court spirit and intrigue then ruled over all in Portugal. Magellan, feeling himself ill-treated, crossed into Spain, and Charles V. magnificently gave him five vessels. But the

king did not venture to trust himself wholly to the Portuguese refugee, and imposed upon him a Castilian colleague. Magellan set out on his voyage between two dangers:—Castilian ill-will and Portuguese vengeance, which planned his assassination. His fleet soon broke out into rebellion; but he confronted it with a terrible, an indomitable, and a barbarous heroism. He flung his colleague into chains, and made himself sole chief. He caused the mutineers to be poniarded, and flayed alive. And, besides all this, a shipwreck! and vessels lost! None were willing to follow him further when they came in sight of the dreary American promontory, the desolate Tierra del Fuego, and the sombre Cape Forward. This region—torn from the mainland by violent convulsions, by the furious ebullition of a thousand volcanoes—seems a tempest of granite. Swollen, and then rent and cracked by a sudden cooling, it horrifies the spectator. Sharp precipitous peaks, fantastic pinnacles, frightful jet-black cones, atrocious three-pointed tusks,—all this mass of lava, and basalt, and volcanic matter, is crested with lugubrious snow.

Magellan and his men were fully satisfied. He exclaimed: "Onwards!" He explored, and tacked, and threaded his way through a hundred isles, and entered upon a limitless Sea, that day unvexed by storm, and therefore named *Pacific*.

He perished in the Philippines. Four vessels were wrecked. The survivor, the *Victory*, carried home in the end no more than thirteen men; but among them its great pilot, the intrepid and indestructible Basque, Sebastian Cabot, who thus returned alone, in 1521, the first of mortals who completed the circumnavigation of the world.

No achievement can surpass it. Thenceforth the globe was sure of its sphericity. This physical marvel of water uniformly extended over a ball to which it adheres with the closest cohesion,—this miracle was demonstrated. The Pacific at length was known—the grand mysterious laboratory where,

far from human eyes, Nature profoundly travails with life, and elaborates for man's behoof new continents and worlds.

A revelation this of immense range; not material only, but moral; which increased a hundredfold the audacity of man, and launched him in another voyage on the unconfined ocean of the sciences, in the effort—rash, but prolific—of achieving the circumnavigation of the infinite.

CHAPTER III.

THE LAW OF STORMS.

IT was but yesterday, as it were, that we mastered the art of constructing vessels adapted for southern navigation;—for battling with the long and heavy wave which, in the boundless Southern Sea, rolls onward and onward, and rises higher and higher, until it attains a mountainous elevation. What shall we say of these pioneers—the Diazes and the Magellans—who ventured themselves upon it in the unwieldy little cockle-shells of their era?

For the Polar Seas especially, both Arctic and Antarctic, vessels constructed on a special model are required. Heroes were they who—like a Cabot, a Barentz, a Willoughby, ascending the torrent of ice in unseaworthy shallops—visited Spitzbergen; opened up Greenland by its funereal portal, Cape Farewell; and penetrated even to that region where, in our own time, two hundred whalers have been dashed to pieces.

It was their very ignorance, their blind courage, their desperate resolution, that was so sublime in these heroic spirits. They knew nothing of the Sea; and braved awful phenomena, of whose causes they had no suspicion. Their knowledge of the sky was equally imperfect. The compass was their only apparatus. They had none of those physical instruments which guide ourselves, and speak to us in language so exact. They went as with eyes closed and into the night. They were

terrified—they said so themselves—but never dismayed. The tempests of the Sea, the whirlwinds of the air, the tragical dialogues of the two oceans, the magnetic storm which we now call the aurora borealis—all this phantasmagoria seemed to them the fury of vexed and indignant Nature, the strife of demons.

For three centuries, no great progress was accomplished. From the stories of Cook and Pérouse we learn the difficulty, peril, and uncertainty of navigation, even in times very near our own.

Cook, with his great courage but lively imagination, was much affected by these circumstances, and in his journal says :—

"The dangers are so great that I venture to say no one will venture to go further than I have been."

Yet it is precisely since that epoch that voyagers have commenced in a regular manner, and been carried to the furthest possible limit.

The nineteenth—a great, a Titanic century—has regarded such objects composedly. It has been the first to look the storm in the face, to note its fury, to write (as it were) to its dictation. Its presages, its characteristics, and its results have all been registered. Then they have been expounded and generalized; and out of them has arisen a system, designated by a name which would anciently have been considered impious—*The Law of Storms.*

Thus what men had once regarded as a caprice was referred to a law. These terrible facts, returning under certain regular forms, lost to a great extent their power of bewildering the mind. Man, composed and unshaken, bethought himself in the midst of danger if it were not possible to oppose to them no less regular means of defence. In two words, if the tempest has developed a *science*, can we not create an *art* of

safety?—an art of avoiding the hurricane, and even profiting by it?

This science cannot have a beginning so long as we cling to the old ideas which attributed the tempest to the "caprice of the winds." Attentive observation has shown very clearly that the winds have no caprice; that they are the accident—sometimes the agent—of the tempest, but that the latter is, in general, an electric phenomenon, and frequently outstrips the winds.

The brother of the conventionist Romme (principal author of the French Republican Calendar) laid the first foundations of the new science. The English had remarked that in the storms of the Indian Seas they sailed a long time without making any actual advance, and found themselves back again at their original point of departure. All their observations were collected by Romme, who demonstrated that the same peculiarity distinguished the hurricanes of China, Africa, and the Carribbean Sea. It was he who first noted the rarity of rectilineal winds, and that the tempest has generally a *circular character*; is, in fact, a cyclone.

The revolving hurricane that broke over the United States in 1815, and that of 1821—the year of the great eruption of Hecla—when the wind blew from all the points of the compass towards a common centre, aroused the attention of America and Europe. Brande in Germany, and, at the same time, Redfield of New York, followed Romme, and established this law, that the tempest was generally *a progressive cyclone, which advances revolving on its own axis.*

In 1838, Reid, the English engineer, having been sent on a mission to Barbadoes, soon after the celebrated whirlwind which destroyed fifteen hundred persons, defined the double movement of rotation. But his principal discovery he formulated thus: *That in our northern hemisphere, the hurricane*

moves from right to left—in other words, it sets out from the east, strikes to the north, and through the west and the south returns to the east. *In the southern hemisphere, the tempest revolves from left to right.*

This proved to be an observation of great practical usefulness, and has since directed our system of nautical manoeuvres.

Reid very justly gave his book a noble title: *On the Law of Storms.*

It was, in truth, the law of their *movement*, not the exposition of their *cause*. It did not explain what created them, or what they are in themselves.

Here France reappeared. Peltier (in his *Causes des Trombes*, 1840) has established, both by numerous facts and by a series of ingenious experiments, that the waterspouts of land and sea are *electrical phenomena*, in which the winds play but a secondary part. This had been suspected by Beccaria, an hundred years before. But it was reserved for Peltier to penetrate the true secret while reproducing the hypothesis, and to prove the agreement between aquatic and aerial cyclones.

Electrical cyclones frequently and readily originate in the vicinity of volcanoes, at the sighing of the subterranean world; and are, therefore, more common in Asiatic Seas than in our own.

The Atlantic, open at either extremity and swept by the winds throughout its whole extent, ought to have fewer cyclones and more rectilineal gales. However, Piddington has cited an infinite number of instances of circular storms.

Between 1840 and 1850, at Calcutta and New York, the immense compilations of Piddington and Maury were perfected. The second, richly illustrated with charts, its "Directions" and its "Physical Geography," is the gospel of the modern sailor. Piddington—less artistic but not less scientific—in his "Seaman's Guide," the encyclopedia of storms, records the

results of an almost boundless experience, the minute modes of calculating the distance of the cyclone or whirlwind—of determining its swiftness, of defining its curve, and the nature of its different undulations. He has corroborated Peltier's opinions, adopted the electrical theory, and refuted the hypotheses which were based on the winds themselves, mistaking the effect for the cause.

The ancient art of augury and the science of prediction, by no means a fitting subject for ridicule, has been happily revived in this admirable book.

The setting sun is not an indifferent guide. If it be red, and the Sea heaves with blood-hued waves, that other sea—the air—prepares for thee a storm. A ring around the sun, a reddish gleam within a pale-coloured circle, changeful stars which seem to shoot below the horizon, are also signs of an ominous travail in the upper region.

Far more menacing the augury if thou shouldst see, on a foul sky, small clouds darting like arrows of sombre purple, if compact masses are built up into strange fantastic piles—broken rainbows, ruined bridges, and a hundred other wild designs. Thou mayest then be assured that on high the drama has already begun. All is calm; but pale lightnings shiver on the horizon. All is calm; but one is ever and anon surprised in the silence by rolling thunders, which cease as suddenly as they arose. The Sea creeps up to the shore, swollen with plaintive sighs. Sometimes, even, a hoarse murmur rises from the very depths. Be thou heedful of it. 'Tis what the English have named "The call of the Sea."

The birds have received a warning. If near the coast, one sees them—cormorants, gulls, or puffins—making towards the land on hurried wing, and seeking refuge among the rocks. Out in the open, thy vessel serves them as an island or point of repose. They wheel all around, and sometimes frankly

claim thy hospitality, and perch upon the masts or rigging. Soon shall come the gloomy petrel, the bird of sinister flight, which so skilfully understands how to endanger the ship, between itself and the storm.

Rejoice, rejoice if it thunders! The electrical discharge taking place on high, so much the less will be bestowed upon the tempest. This observation of the ancients has been scientifically confirmed by Peltier, and by the experience of Piddington and many others.

If the electricity accumulated in the upper air descend in silence, and there should be no rain, the discharge will then occur below, and create a succession of circular currents. There will be both cyclone and tempest.

Occasionally a cyclone overtakes the seaman in the roads. In 1698, Captain Langford, when lying in port and securely anchored, saw the coming cyclone; and immediately cutting his cables, put out to sea. The more prudent vessels remained, and were dashed to pieces.

At Madras and Barbadoes signals are given to warn the ships at anchor. In Canada the electric telegraph, which is even more rapid than the electricity of heaven, sends notice from port to port of the advent of the tempest which will shortly visit them.

For the mariner out at sea the barometer is the great counsellor. Its perfect sensibility reveals the exact degree of the atmospheric pressure. Silent at first, it seems asleep. But a light touch has disturbed it, the preliminary flourish of the grand overture. Now observe its restlessness. It responds, vibrates, oscillates; it falls back, it sinks. The elastic atmosphere gives way under the heavy vapours, then suddenly rebounds and reascends. The barometer has its own internal tempest. Flashes of pale light sometimes escape from the mercury, and fill its tube (as Péron observed at the Mauritius).

During the squalls, it seems to breathe. "The water barometer, in its fluctuations," say Daniel and Barlow, "gasped and panted like a wild beast."

Meanwhile the cyclone advances, and, sometimes, openly as it advances, illuminates its vast density with all its electric gleams. At times it announces itself by jets and balls of fire. In 1772, during the great hurricane of the West Indies, when the Sea rose seventy feet, the gloomy shores were lighted up with fiery globes.

It approaches with more or less rapidity. In the Indian Ocean, sown with islets and rocks and shoals, the cyclone frequently does not exceed the rate of two miles an hour; while in the warm Gulf Stream which comes to us from the Antilles, it rushes along with a speed of three and forty miles. Its force of translation would be incalculable but for its internal oscillation under the pressure of the winds within and without.

But slow or swift, its fury is the same. In 1789 it sufficed for one moment and a single wave to wreck every vessel in the port of Coringa, and hurl them inland on the plains; a second wave inundated the town; a third shattered it in ruins, and buried, crushed, or drowned, twenty thousand inhabitants. In 1822, on the other hand, at the mouths of the Hooghly, the cyclone for four and twenty hours was seen to suck in the air, and with it the water; fifty thousand men, women, and children were then engulfed.

Its aspect varies. In Africa it is the *tornado*. In calm clear weather you become sensible of an oppression on the chest. A black point is then visible in the sky, like a vulture's wing. This vulture descends; its size is immense; everything disappears, everything revolves. In a quarter of an hour all is over. The land is devastated, and the Sea convulsed. Of the ship no news! Nature remembers it no more.

In the regions of Sumatra or Bengal you see towards evening or in the night (not at morning) an arch developing itself on high. In a moment it enlarges, and from its black span floods of pale sombre lightning pour down a wan sickly lustre. Woe to the ship which receives the first stroke of the wind issuing from the depths! It may founder, and sink to the bottom.

But its usual form is that of a funnel. A mariner who was overtaken by it says:—"I saw myself, as it were, at the bottom of an enormous volcanic crater; around us nothing but shadow; above, an opening and a glimpse of light." This is technically called *the eye of the storm.*

When once it has seized upon you, resistance becomes useless; it holds you with an iron grasp. Savage roars, plaintive howlings, the rattling and cries of the drowning, the groans of the unhappy vessel, which seems to have regained the life of its native forest, and now bewails its approaching death,—all this horrible discord does not prevent one from hearing in the rigging the shrill hissing of serpents. Suddenly, silence!—The nucleus of the cyclone then passes in the terrible thunder-clap which deafens and almost blinds you.—You recover your senses, but it has shattered every mast without your having heard a sound.

Occasionally the crew will for a long time afterwards suffer from weakened sight and blackened nails. They remember then with horror that at the moment of its passage, the whirlwind, in sucking up the water, also sucked up the ship, as if fain to swallow it, held it suspended in the air and out of the sea, then relaxed its grasp, and dashed it into the abyss.

Seeing it thus gorge and inflate itself, seeing it thus absorb both waves and vessels, the Chinese have conceived of it as of a frightful woman, the mother Typhon, which, hovering in the sky and selecting its victims, breeds and grows pregnant with children of death, the *iron whirlwinds,* or *Keu Woo.*

They have raised temples and altars in its honour. They pray to it and worship it, in the hope of *humanizing* it.

But the brave Piddington does not adore it. Quite the contrary. He speaks of it without disguise. He calls it an over-strong corsair, a rascally pirate which abuses its strength, and with which we ought not to consider it a point of honour to contend. We must fly from it, without thinking of honour.

Not seldom this perfidious enemy spreads a snare for you, and beguiles you with *a good wind.* It hastens to embrace you. Leave this *good wind,* and, if possible, turn your back upon it. Sail as far away as you can from so dangerous a companion. Do not sail under its convoy. It will watch its moment to entangle you in its bacchanal dance, overcome, and devour you.

I should wish to follow all the paternal counsels of this excellent Piddington. They would be useless, it is true, if the two adversaries, the cyclone and the ship, were penned up in a small space, as in the lists of a tourney. But such is rarely the case. Most frequently the whirl of air and water is immense, extending over a circle of ten, twenty, or thirty leagues. This gives the ship a chance of observing its approach, and of keeping at a respectful distance. The great thing is to know where *the cyclone is central,*—which is its centre of attraction,—and then to estimate its rate of progress, and the swiftness with which it is bearing down upon you.

It is a beautiful guiding light which the modern seaman derives from these two signal-lamps! On the one side, Maury teaches him the general laws of the sea and air, the art of choosing and following the currents; he directs him by duly calculated paths, which are, so to speak, the streets of Ocean. On the other side, Piddington, in one small volume, has con-

densed and placed in his hand the experience of storms, with instructions how to avoid, and even profit by them.

This explains and justifies the beautiful language of the Dutch captain, Jansen:—"At sea, the first impression is the feeling of the abyss, of the infinite, of our nothingness. On board the mightiest ship, one always feels in peril. But when one's mental gaze has sounded the space and the profundity, danger disappears. One begins to understand the scene, and rise to a level with it. Guided by astronomy, instructed in the liquid highways, directed by Maury's charts, he traces his route upon the ocean in *security*."

This is simply sublime. The tempest is not suppressed, but ignorance *is*—and the trouble and the apprehension produced by the obscureness of the danger—and the worst of all peril, its fantastic element. At all events, now, if one perishes, one knows wherefore. Great is the *security*, very great, of preserving the mind unclouded, the soul fully enlightened, resigned to whatsoever effects may result from the grand and divine laws of the world, which, at the cost of a few shipwrecks, constitute its equilibrium and its safety.

CHAPTER IV.

THE POLAR SEAS.

THE useless and the impossible have a peculiar attraction for man. Of all maritime enterprises, the one which has most called forth his perseverance is the discovery of a passage to the north of America communicating between Europe and Asia. The slightest effort of common sense, however, might have warned him beforehand that if such a passage existed, in a latitude so cold, in the zone of bristling ice, it could be of no possible service, and that no ship could profit by it.

Observe that this region wants the level character of the Siberian shores, where you can glide over the frozen snows in a sledge. It is a mountain, one thousand leagues in extent, horribly broken up, with deep yawning chasms, seas which melt for a moment to freeze again directly, galleries of ice which change annually, open, and close upon you.

This passage was discovered by a man who, having pushed forward a considerable distance, and finding himself unable to retrace his steps, boldly continued his advance, and succeeded in conquering every obstacle (1853). We know now what it is. Our imaginations are therefore calmed, and we no longer feel excited.

When I spoke of it as *useless*, I meant for the purpose it had been specially proposed to serve—a commercial highway.

But, while following up this Will-o'-the-wisp, man has enriched himself with many things by no means chimerical, and of great utility for science—for geography, meteorology, and the study of terrestrial magnetism.

What was originally the object? To open up a short road to the land of gold, the East Indies. England and other European states, jealous of Spain and Portugal, relied on thus surprising them in the heart of their remote empire, the sanctuary of their wealth. From the time of Elizabeth, the seekers having found, or thought they had found, some pieces of gold in Greenland, revived the old Norse legend of a treasure hidden under the Pole, of masses of gold guarded by gnomes. It influenced every mind. Inspired by so rational a hope, a great fleet of vessels was despatched, carrying as volunteers the sons of the noblest families. They contended with each other who should set out for this Polar El Dorado. What they really found was—death, hunger, ramparts of ice.

The check was of little avail. For more than three centuries, with an astonishing perseverance, a host of explorers eagerly pursued the dream. It was a succession of martyrs. Cabot, the pioneer, was only saved by the mutiny of his crew, which prevented him from venturing further. Barentz died of cold, and Willoughby of famine. Cortereal perished, with his crew and treasures. Hudson was thrown by his own men into a small boat, without provisions and without sails, and we know not what became of him. Behring, discovering the strait which separates America from Asia, died of hunger, cold, and misery in a desert island. In our own days, Franklin was lost among the ice, and only recovered *dead*, he and his men having suffered the terrible necessity of recurring to the *last resource* (of eating dead human bodies)!

All the conditions which can discourage men are found re-

united at the portal of this Arctic navigation. Far in advance of the Polar Circle, a cold mist weighs upon the Sea, chills you, and covers you with rime. The cordage stiffens; the canvas becomes immovable; the deck is slippery with the frost; manoeuvring grows difficult. The moving ice-floes, which are so much to be dreaded, can scarcely be distinguished. From the mast-head, in his little cradle crusted with rime, the look-out man—a true living stalactite—signals, from moment to moment, the approach of a new enemy, of a gigantic white phantom, which often towers two and three hundred feet above the water.

But the gloomy procession which thus heralds the world of ice, this struggle to avoid it, does but stimulate the desire to penetrate further. In the unknown vastness of the Pole lurks an undefinable charm of sublime horror, of heroical suffering. Those who, without attempting the North-West Passage, have only visited the north, and surveyed Spitzbergen, retain a profound impression of it. That mass of peaks and mountain-chains and precipices, which uplift their crystal crests to an elevation of 4500 feet, looms like an apparition in the sombre Sea. Its glaciers stand out defined upon the dead dull snow in living lustre, in green and blue and purple lights, in coruscations, in flashing jewels, which shine like a dazzling diadem.

During the prolonged night of several months, the aurora borealis glows every moment in the capricious splendours of an ominous illumination—of vast and terrific conflagrations, which occupy the entire horizon; an eruption of magnificent jets; a fantastical Etna, inundating with illusory lava the scene of the eternal winter!

All is prismatic in an atmosphere of icy stones, where the air solely consists of mirrors and little crystals. Thence arise the most wonderful mirages. Numerous objects seen in reverse appear for the moment with their lower side upmost. The strata of air which produce these effects are in constant

revolution; that which becomes the lightest rises in its turn, and changes everything; the slightest variation of temperature lowers, raises, or inclines the mirror; the image blends itself with the object, then separates, and finally disperses; another reversed image thereupon mounts upwards; a third appears, pale, weakened, and reversed anew.

It is the world of illusion. If you are partial to dreams—if dreaming awake you find a pleasure in following up the mobile improvisation and changeful play of the clouds—go to the North; there, you will find everything in reality, yet not less fugitive, in the throng of the moving ice. On your route, they present a theatrical spectacle. They mimic every order of architecture. Here is the classic Greek, with its porticoes and colonnades. Now Egyptian obelisks make their appearance, with spires which point heavenwards, supported by other but fallen spires. Next see the towering mountains—Ossa upon Pelion—the city of the giants—which, assuming a regular aspect, astonish you with the likeness of Cyclopean walls and Druidical table-stones and dolmêns. Underneath they sink into gloomy caverns. But all this is frail: all undulates and crumbles into nothingness at the breath of the wind. You can feel no delight in it, from its transitory nature. Every moment, in this topsy-turvy world, the law of gravity counts for nothing: the light and feeble support the strong; it is, as it seems, a ridiculous art, a gigantic child's play, which threatens and is able to destroy you.

Sometimes a terrible incident occurs. Right through the grand armada which slowly and majestically descends from the north, suddenly comes from the dim south a deep-based giant, which, plunging six or seven hundred feet beneath the sea, is violently driven forward by the lower currents. It disperses or overthrows everything; it approaches, it arrives off the vast field of ice-floes—but is not embarrassed. "The bank was shattered in a minute over an extent of several

miles. It crashed and thundered like a hundred pieces of artillery; it resembled an earthquake. The mountain drove near us; all between us and it was a mass of shattered blocks. We must have perished, had it not veered aside, and been rapidly borne to the north-east" (Duncan, 1826).

It was in 1818, after the European war, that man resumed this war against Nature, the discovery of the great North-West Passage. It opened with a grave and singular event. The gallant Captain Sir John Ross, having been despatched with a couple of ships to Baffin's Bay, was duped by the phantasmagoria of the Arctic dream-world. He distinctly saw a land which did not exist, and maintained that it was impossible to pass it. On his return, he was overwhelmed with reproaches; he was told that he had not dared to make the attempt; he was even refused an opportunity of re-establishing his honour. A wine-merchant of London was brave enough to do what the British Empire refused to do. He placed at his disposal a sum of £20,000, and Ross returned to the North, determined to pass the barrier or perish. Neither termination of his trouble was granted to him. But he remained, for I know not how many winters, unthought of and forgotten, in these terrible solitudes. He was at length restored to his home by some whalers, who, meeting with the supposed savage, asked him if at any time he had happened to meet with the *late Captain John Ross.*

His lieutenant, Parry, who had imagined himself sure of passing, four times made the most obstinate efforts; now by Baffin's Bay and the west, and then by Spitzbergen and the north. He accomplished several discoveries, boldly pushing forward with a boat-sledge, which alternately floated or crossed the ice-floes. But these, invariable in their southern route, always closed in upon his rear. He could no more pass than Ross.

In 1832, a courageous young Frenchman, Jules de Blosseville, was desirous of winning this glory for France. He devoted to it his life and fortune; embarked all he had—to perish! He could not obtain even a vessel of his choice; the *Lilloise* was given to him, which sprang a leak on the very day of his departure. He repaired her at his own cost; that is, for £1500. In so dangerous a bark he prepared to confront the iron coast of Eastern Greenland. According to all appearances, he never arrived there. No tidings have ever been heard of him.

The English expeditions were very differently equipped—with great prudence and at a great outlay—but they were not more successful. In 1845, the unfortunate Franklin perished among the ice. For twelve years the search after him was continued, England displaying an honourable obstinacy. All nations assisted in it. Americans and Frenchmen perished in prosecuting it. The peaks and capes of that desolate region, by the side of Franklin's name will cherish that of Bellot, who devoted himself to save an Englishman. On his side, Sir John Ross had offered to direct our seamen in the search after Blosseville, and to organize an expedition. Sombre Greenland is enriched with memories such as these; and the desert is no longer a desert when we meet there such genial names, the evidences of human brotherhood.

Lady Franklin's constancy was admirable. She would never believe herself widowed. Incessantly she urged on new expeditions. She protested that her husband still lived; and had so great an influence on the national mind that, seven years after he was lost, he was promoted to the rank of vice-admiral. She was right; he lived. In 1850, the Esquimaux saw him (they assert) with sixty men. Soon these were reduced to thirty, who could no longer march or hunt. They were compelled to eat the bodies of their dead companions. If the Government had listened to Lady Franklin, they might

have been rescued; for she said—and common sense also said—that the search should be made towards the south; that a man in so desperate a situation would not aggravate its miseries by marching towards the north. The Admiralty, probably troubling itself less about Franklin than about the famous Passage, still despatched its missions to the north. The poor lonely wife at last accomplished what the Government would not. She equipped at a considerable outlay a ship for the south. But it was too late. The navigators found only Franklin's bones.

Meanwhile, longer and more fortunate voyages were made towards the Antarctic Pole. We do not find there that mixture of land, sea, ice, and tempestuous thaws, which make Greenland horrible. It is a vast boundless sea, with a strong and violent swell. An immense ice-store, far more extensive than our own. Very little land. In reference even to those shores which our navigators have seen—or think they have seen—it must always be doubtful whether their shifting outlines may not be a simple line of continuous and accumulated ice. Their aspect varies every winter. Morel in 1820, Weddell in 1824, and Ballerry in 1839, found a channel, and penetrated into an open sea, which later voyagers have not been able to rediscover.

The French navigator Kerguelen, and the English, Sir James Ross, have, however, wrought out some definite results, and found an incontestable land.

The former, in 1771, discovered the large island *Kerguelen*, which the English call *Desolation*. Two hundred leagues in length, it possesses excellent harbours; and, in spite of its climate, a tolerably abundant animal life—seals and birds—for provisioning a ship. This glorious discovery—which Louis XVI., on his accession to the throne, rewarded by the promotion of the discoverer—proved Kerguelen's

ruin. He was accused of various crimes. The infuriated rivalry of aristocratic officers overwhelmed him. His jealous antagonists bribed witnesses against him. It is from a dungeon of six feet square that he dates the journal of his voyage (1782).

In 1838, France, England, and America despatched three expeditions in the interest of science. The illustrious Duperrey had inaugurated magnetical observations; and it was desirable they should be continued under the very Pole. The English equipped an expedition for this purpose, and entrusted it to Sir James Ross, the nephew, pupil, and lieutenant of Sir John Ross, of whom we have already spoken. It was a model armament, in which everything was calculated, selected, and foreseen. Sir James Ross returned to England without having *lost a single man*, or even having had *one invalid*.

The American Wilkes and the French Dumont d'Urville were by no means so carefully equipped. The dangers they encountered, and the maladies that visited them, proved terrible for their crews. But Ross, crossing the Antarctic Circle, entered the ice, and came upon a real land. With a notable modesty, he confesses that his success was solely due to the admirably careful manner in which his vessels had been prepared. The *Erebus* and the *Terror*, with their powerful machines, their saw, their prow, their breastplate of iron, opened up the icy cincture, and navigated through the grinding crust, tenanted by seals and birds and whales. A volcano, 12,000 feet in height—as lofty as Etna—ejected flames. No vegetation was visible, and no landing-place; only a scarped granite cliff, where even the snow could find no resting-place. But it is land; of that no doubt exists. The Etna of the Pole, which has been named *Mount Erebus*, with its column of fire, remains as a witness of the fact.

Thus a nucleus of land centralizes the Antarctic ice (1841).

To return to our Arctic Pole: the months of April and May 1853 are a memorable epoch in its history.

In April was found the Passage which men had sought for upwards of three hundred years. We owe the discovery to a felicitous stroke of despair.

Captain M'Clure, having entered the Polar Sea by Behring's Strait, got imprisoned in the ice, and at the end of a couple of years, being in a perishing condition with hunger, and unable to return, hazarded all upon a forward movement. He marched forty miles, and found in the Eastern Sea some English ships. His boldness saved him, and the great discovery at length was consummated.

At the same time (May 1853) an expedition started from New York for the extreme North. A young seaman, Elisha Kent Kane, not thirty years old, but who had already traversed the whole earth, had given expression to a bold but very beautiful idea, which keenly stimulated American ambition. Just as Wilkes had promised to discover a World, Kane undertook to find a Sea—an open Sea—under the Pole. While the English, in their routine, pushed their researches from east to west, Kane proposed to strike due north, and take possession of this unexplored basin. A New York shipbuilder, Mr. Grinnell, generously gave a couple of vessels. The scientific societies lent their assistance, and so did the public. The ladies with their own hands worked at the preparations, inspired by a religious zeal. The crews, carefully selected, and wholly composed of volunteers, swore three things: obedience, abstinence from intoxicating liquors, and from profane language. The failure of a first expedition neither discouraged Mr. Grinnell nor the American public. A second was organized with the aid of certain societies in London, which had in view a Biblical propaganda, or a last search after Franklin.

Few narratives of voyages are more interesting, and it

very clearly explains the ascendancy which young Kane had exercised. Every line is marked with force, and brilliant vivacity, and a marvellous *go-ahead* spirit. He knows everything, is sure of everything, ardent, but positive. He will never give way—one feels—before any obstacle. He will go far, and as far as one *can* go. The struggle is curious between a character like this and the pitilessly slow Northern nature, consisting of a succession of terrible barriers. He had scarcely set out before winter overtook him, and he was compelled to hibernate among the ice for six months. Even in spring a temperature prevailed of seventy degrees.—On the approach of a second winter, August 28th, his crew abandons him; only eight men remain with him out of seventeen. The fewer men he has, and the fewer resources, the harder and keener he becomes; determined, he says, to make himself more respected. His good friends, the Esquimaux, who assist him with supplies of food, steal from him three copper vessels. In return, he carries off two of their women—a savage and an excessive punishment. Among eight sailors whom he has with difficulty kept by his side, and whose discipline is necessarily relaxed, it was not prudent to entrust these poor creatures. They were married. "Sivu, wife of Metek," and "Aningna, wife of Marsinga," remain, weeping, five days. Kane compels himself to laugh, and makes us laugh. "They wept," says he, "and chanted their laments, but did not lose their appetite." Their husbands and kinsmen arrive with the stolen articles, and take every affront good-temperedly, like intelligent men, who have no other arms than fish-bones to oppose to a revolver. They subscribe to everything, promise their friendship and alliance. But, a few days afterwards, they have fled—have disappeared! With what sentiments of friendship, one can easily imagine! They will tell the wandering tribes whom they encounter on their route, that they must fly from the white man. And it is thus that Man closes a world against men.

The sequel is very gloomy. So bitter were their sufferings that some died and others would fain return. Kane did not abandon his purpose; he had promised a Sea, and a Sea he must find. Plots, desertions, and treasons,—all enhanced the horror of his situation. During his third winter, he would have perished, for lack of food and fuel, if some Esquimaux had not supported him with the produce of their fishery, and he, in return, hunted for them. Meantime, a party of his men, whom he had despatched on an exploring expedition, were fortunate enough to catch sight of the Ocean he so urgently desired. At least they report that they perceived a great extent of open and unfrozen water, and about its shore a number of birds which seemed to have taken shelter in this more genial climate.

Having made this discovery, Kane could return. To the Esquimaux who had saved him, and had neither taken advantage of their numbers nor of his misery, he left his ice-imprisoned vessel.

Feeble and exhausted, he nevertheless succeeded, after a journey of eighty-two days, in returning to the South; but only to die. This young and resolute hero, who approached nearer to the Pole than any other mortal, in dying, carried off the crown which the scientific societies of France have deposited on his tomb—the grand prize of geography.

Among all the terrible incidents of this story one occurs to us as the most pathetic, and as affording an accurate idea of the sufferings entailed by such an enterprise: I mean, the death of his dogs. He had some Newfoundlanders of admirable sagacity, and also some Esquimaux dogs; and these were far more intimately his comrades than any of his men. During his long winterings—during those nights protracted over several months—they kept guard around the ship. If he went forth into the dense darkness he ever encountered the warm breath of these honest creatures, who came to caress his hands.

The Newfoundlanders were the first to fall sick. He attributed their illness to the want of light, and when he placed some lanterns about the place, they got better. But gradually they fell victims to a strange melancholy—they became mad. The Esquimaux dogs went the same way, and none were left to Kane but his bitch Flora, the most sagacious and the most reflective, who did not grow delirious like her companions, and survived her trials. This is the only point, I think, in all his rugged story, where his resolute heart seems moved.

CHAPTER V.

WAR WITH THE RACES OF THE SEA.

IN reflecting upon the preceding remarks, and upon the general history of maritime enterprise, the mind is affected by two opposite sentiments:—

1st. By admiration of the audacity and the genius which man has displayed in conquering the Seas, and making himself master of his globe.

2nd. By astonishment at his want of skill in everything which relates to man; at his ignorance of the best way of utilizing persons for the conquest of things; by the fact that wherever he has come as a navigator he has come as an enemy, has broken up and destroyed the young races which, properly managed, would have been the special instrument, each in its own little world, of enabling him to profit by it.

Behold Man in presence of the globe which he has just discovered: he resembles a musical novice before an immense organ, whence he can draw but a few rude and imperfect strains. Issuing out of the Middle Ages, after so much theological and philosophical study, he is still a barbarian: of the sacred instrument he can but break the strings.

The gold-seekers began the work, as we have seen, in their lust for gold, and only gold, by destroying man. Columbus, the purest of all, shows this in his own journal with a terrible *naïveté* which fills our minds with sad anticipations of

what will be done by his successors. When he arrives off Haïti, his first words are: "Where is the gold? Who has any gold?" The natives smiled, astonished at this hungering for gold. They promised him to go in search of some. They tore off their own rings to satisfy more readily his craving appetite.

He paints us a pathetic picture of that unfortunate race, of its physical beauty, its goodness of disposition, its affecting trustfulness. Nevertheless, the Genoese has his mission of avarice, and his harsh mental moods. The Turkish wars, the atrocious galleys and their branded criminals, the human auctions,—such things were then the common every-day life. The sight of this young and unarmed world—with its naked children, and innocent, charming women—does but inspire him with a painfully mercantile reflection; namely, that they will make excellent slaves!

He forbids their removal, however, "for they belong to the King and Queen." But he lets fall certain dark and gloomily significant words:—"They are timid, and born to obey. They will do whatever they are commanded. A thousand of them will take flight before three or four of our men. If your Highnesses should order me to carry them off, or to compel their services here, there would be no difficulty; fifty men would be sufficient" (October 14, and December 16).

Immediately will return from Europe a decree for the general seizure of the unhappy people. They become the slaves of gold—all are employed in seeking for it, all are doomed to compulsory labour. He himself informs us that, twelve years afterwards, six-sevenths of the population had disappeared; and Herrera adds that, in twenty-five years, the number fell from one million souls to fourteen thousand.

What followed everybody knows. The miner and the

planter between them exterminated the New World, repeopling it incessantly at the cost of the negro races. And what has been the result? The black alone has lived, and lives, in the low, warm, and exuberantly fertile lands. America will be his heritage; and Europe has accomplished exactly the reverse of what she designed.

Its colonial impotency has been everywhere revealed. The French adventurer has not survived: he migrated without a family, and carrying with him his vices, was absorbed in the mass of barbarism, instead of civilizing it. The Englishman, except in two temperate regions whither he has transferred himself *en masse* and *en famille*, flourishes no longer across the seas: India, in a century, will not know that he ever ruled it.* Has the Protestant or Catholic missionary had any influence? Has he converted a single disciple? "*Not one*," says Burnouf, a competent authority. Between them and us thirty centuries intervene, and thirty religions. When any attempt is made to force their brain, it happens as Humboldt observed in the American villages, which still bear the appellation of *Missions;* having lost their own native pith, without gaining anything from us, living in body and dead in mind, barren, and for ever useless, they degenerate into full-grown children—besotted, and idiotic.

What advantage have the savages derived from those scientific voyages, which do so much honour to us moderns, or from the contact of civilized Europe, which travels everywhere, and visits all countries? As far as I can see, none. While the heroical races of North America perish of hunger and misery, the soft and gentle races of Oceania melt away, to the utter shame of our seamen, who there, at the end of the world, fling aside the mask of decency, and spurn all restraint. The weak and amiable people, whom Bougainville found

* [With all due deference to M. Michelet, we venture to think that he is here misled by his love of brilliant exaggeration.—*Translator.*]

abandoned to an excess of careless felicity, and among whom the merchant-apostles of England gain lucre and no souls, vanishes, miserably devoured by the vices and diseases of our civilization.

The long line of Siberian coast was formerly inhabited. Under its rugged climate the nomades lived and flourished, hunting the animals clothed in valuable furs, which provided them with food and garments. The stolid policy of Russia has compelled them to settle in permanent habitations, and adopt agricultural pursuits in a region where cultivation is impossible! Therefore they die, and especially the male population. On the other hand, insatiable and unforeseeing Commerce, not even sparing the beast during its breeding-season, has equally exterminated the animal races. Solitude now prevails—a perfect solitude—over a coast one thousand leagues in extent. Let the wind blow, let the waters freeze, let the aurora borealis transfigure the protracted night. Nature now has no other spectator than herself.

It ought to have been the great object, in the Arctic voyages to Greenland, to have concluded at any cost a friendly compact with the Esquimaux; to have mitigated their miseries; to have adopted their children, and carried them to Europe; to have founded colonies in their midst, and schools of discoverers. From the pages of Sir John Ross, and other navigators, it is evident that they are an intelligent people, who very readily accept the arts of Europe. Marriages might have been contracted between our seamen and their young women. A mixed population would have arisen, to whom the Northern continent would have belonged. This was the true means of easily discovering and regulating the eagerly-desired Passage. It would have required but thirty years, and we have spent three hundred; and, after all, have accomplished nothing, because, by terrifying the poor savages, who escape to the North and die, we have definitively destroyed *the*

man of the place and the genius of the place! What avails it that we have seen this desert, if it becomes for ever uninhabitable and impracticable?

We may reasonably conclude that if man has thus treated *man*, he has shown no greater clemency or wisdom in his dealings with the *animals*. Among the gentlest species he has committed the most horrible ravages, and reduced them for ever to a condition of wildness and barbarism.

All the older narratives agree in saying that, at our first approaches, they showed only a spirit of trust and sympathetic curiosity. Men passed through tranquil herds of lamantins and seals which never shrunk from their advance. The penguin and the awk followed in the voyager's steps, took advantage of his fire, and at night glided trustfully under the clothes of the seamen.

Our ancestors delighted to think, and not without some degree of probability, that animals felt like ourselves. The Flemings enticed the shad with the ringing of bells. When music was played on board a vessel, the whale never failed to make his appearance; and the jubarte especially took pleasure in the neighbourhood of men, frolicking and gambolling all around them.

The rite of marriage, which the animals formerly possessed, has been almost nullified by dint of human persecution. Isolated and fugitive, they now enjoy but a transitory love-fit, and have sunk into the condition of a wretched celibate, who ever increases in sterility.

Marriage, permanent and genuine, is a condition of nature found amongst all races. Marriage, and to a single mate, faithful unto death, exists among the roe-deer, the pies, the pigeons, the inseparables (a pretty species of parroquet), and the courageous kamichis. Among other genera of birds it

lasts at all events until the young have been trained to get their own living. The family are then compelled to separate, owing to the necessity they are under of extending the area where they seek their supplies of food.

The hare preserves throughout its agitated existence, and the bat in its life of shadows, a tender affection for their young. No such feeling exists, however, among the crustacea or poulpes, who neither love nor defend one another. When the female is taken, the male dashes headlong after her, and suffers himself to be captured.

How much more strongly does the love of family, and marriage in its proper sense, prevail among the gentle amphibia! A permanent union is in their case favoured by their slowness and sedentary life. In the walrus, or sea-elephant, ungainly and colossal as is the animal, love shows itself intrepid: the husband will die for his mate, and she for her cub. But an unique circumstance, which we observe in connection with no other race, and not even among the highest animals, is, that when the little one, whom its mother has saved and concealed, sees her struggling on its behalf, it hastens to her defence, and with admirable courage fights and perishes for her.

Among the otaries, another amphibian order, Steller witnessed a most remarkable scene;—one absolutely human in its details.

A female had suffered her cub to be stolen. The husband, in a transport of fury, beat her. Then she humbled herself before him, and kissed him, shedding hot tears, which actually flooded her bosom.

Though the whales do not enjoy the fixed life of these amphibia, in their wandering courses over ocean, yet they willingly come together in couples. Duhamel and Lacépède record that, in 1723, two whales, which they met with in this fond companionship, would not separate even when grievously

wounded. The one having been killed, the other threw herself on his body, roaring terribly.

If there existed in this world a creature peculiarly susceptible of training or culture, it was the right or Greenland whale; — that admirable treasure, in which Nature has accumulated so much wealth. A creature, moreover, wholly inoffensive, which wars with none, and does not feed upon any of those species adapted for human aliment. Except its formidable tail, it has no weapon, no mode of defence. And it has such a host of enemies! All the world is in arms against it. Numerous species plant themselves upon it, live upon it, and even gnaw its tongue. The narwhal, armed with piercing tusks, drives them into its flesh. The leaping dolphin nibbles at it; and the stealthy shark, with one sudden stroke of its saw-like jaws, tears off a bleeding shred.

Two blind and ferocious creatures attack it in its future, and cowardly make war upon its pregnant females—I mean, the cachalot and man. The horrible cachalot, whose head is a third of his body—which is one formidable mass of teeth and jaws—rips open the womb with his eight-and-forty teeth, and devours the foetus. Then, while the mother howls in agony, he destroys her also. Man exposes her to more protracted sufferings: he sheds her blood, and inflicts upon her a succession of the cruellest wounds. Tenacious of life, she shudders and trembles throughout her prolonged torture, with terrible revivals of strength and increased anguish. She is dead; yet her tail, as if galvanized, quivers with an awful spasm, and those poor arms vibrate, which but now were warm with maternal love. They seem to be living still, and still to seek the little one.

It is impossible to picture to one's-self the full character of this war a hundred or two hundred years ago, when whales abounded, navigated the waters in numerous shoals, and every

shore was thronged with an amphibian population. The massacres which then took place were immense, and torrents of blood were poured out, such as were never known in the greatest battles. Fifteen or twenty whales were frequently killed in one day, and fifteen hundred sea-elephants! That is, men slew for the sake of slaying. For what could they profit by such a pile of slaughtered giants, when one alone yielded so vast a quantity of oil and blood? What was the object of the incarnadined flood? To redden earth? To pollute the Sea?

No; they longed for the enjoyment which executioners and tyrants feel: to strike, to torture, to exult in their strength and their fury, to taste of pain and death. Often they amused themselves by inflicting all the agonies of a slow death on animals too unwieldy or too gentle to revenge themselves. Péron saw a sailor after this fashion torturing a female seal. She wept like a woman, and groaned pitifully; but every time she opened her bleeding mouth, he struck her with a heavy oar, and shattered her teeth.

In the New South Shetland Islands, writes Dumont d'Urville, the English and Americans, in four years, have exterminated the seals. In the blindness of their indiscriminate lust of blood they cut the throats of the new-born, and killed the females big with young. Frequently they slew them for their skin alone, and lost enormous quantities of oil, by which the world might otherwise have profited.

This carnival is a detestable school for ferocity, which tends to the utter depravation of the human character. The most hideous instincts come to light in the sanguinary intoxication. O shame of nature! On such occasions you see indications of something unexpected—something horrible—in every heart, even in the most refined. Among a peaceable people, and on the most charming shore, a strange festival is celebrated.

From five to six hundred tunnys will be driven together, and massacred in one day. Within a ring of boats, the vast net, the madrague, divided into several compartments, and supported by capstans, forces them onward gradually until they are all at length confined in the *chamber of death.** And around it gather expectantly two hundred bronzed men, armed with hooks and harpoons. From a circuit of twenty leagues flock the *haut monde*, the pretty women and their lovers. They post themselves on the beach, and as near as possible, to witness the butchery, to adorn the enclosure with a ring of beauty. The signal is given: the harpooners strike! The fish—one might almost call them men—leap about in terror, pierced, wounded, cloven, reddening the water with a deep incarnadine. Their pitiful agitation, and the fury of their butchers; the Sea, which is no longer sea but an indescribable foaming *something* that lives and rages; all, all mounts to the brain. Those who only came to look on are carried away by the whirl and excitement; they stamp their feet, they shout, they reproach the fishermen because they kill so slowly. Finally, the latter narrow and confine the area of slaughter; the swarming mass of the wounded, dead, and dying is concentrated at a single point; the leaps are convulsive, and the blows furious; the water leaps, and the spray crimsons.

And now the intoxication is at its height. Even the women forget their sex and catch the general frenzy. When the spectacle is at an end, they sigh, exhausted but not satisfied, exclaiming as they quit the scene:—"What! is that all?"

* This is the mode of tunny-fishing pursued on the coast of Provence, and in some other parts of the Mediterranean.

CHAPTER VI.

THE RIGHT OF THE SEA.

A GREAT popular writer, who invests every theme he touches with a character of luminous and impressive simplicity, Eugene Noel, has said :—" We may convert the Ocean into an immense storehouse of provision, a laboratory of subsistence more productive than Earth itself; we may render seas and rivers, streams and lakes, prolific. We have cultivated only the land; now rises the art of cultivating the waters.—Hear, O ye nations!"

More productive than Earth! How can that be? M. Baude explains very clearly in an important work on the Fisheries which he has recently published. Of all creatures, the fish is most capable of enormous increase on a minimum of food. Of all creatures, the fish alone requires nothing, or nearly nothing, for its support. Rondelet tells us of a carp which he kept for three years in a bottle of water, without feeding it, but which, nevertheless, so increased in size that it could not get out of the bottle. The salmon, during its two months' residence in fresh waters, abstains almost entirely from food, and yet does not waste away. Its sojourn in the salt water ensures it on an average the prodigious increase of six pounds of flesh. There is no resemblance here to the slow and costly progression of our terrestrial animals. If we accumulated in one spot all that is eaten by an ox, or only a

pig, for fattening it, we should be frightened at the mountain of food it had consumed.

Hence the people for whom the question of a food-supply has always been most pressing, the Chinese—so prolific, so numerous, with their three hundred millions of souls—have specially addressed themselves to this remarkable power of generation, the richest manufacture of nourishing life. Along the entire course of the great rivers of China, prodigious numbers have sought in the water a more regular source of food than agriculture. The farmer is ever apprehensive; and a gust of wind, a frost, the slightest accident, may ruin everything, and overwhelm him with famine. On the contrary, the living harvest teeming and maturing in the depths of these rivers nourishes without variation the innumerable families which cover them with their boats, and which, assured of a constant supply of fish, swarm and multiply as they do.

In May an extensive traffic takes place on the central river of the empire in spawn. Merchants purchase it to retail it everywhere to those who require the fecundating element for their domestic fish-ponds. Each housekeeper has in this way his reserve, which he feeds at no expense on the refuse from his table.

The Romans pursued the same plan, and carried the art of acclimatization to such a degree of perfection as to hatch in fresh water the eggs of salt water fish!

Artificial fecundation, discovered in the last century by Jacobi in Germany—very successfully practised in England in our own time—was re-invented in France, about 1840, by a fisherman of La Bresse, named Remy, and since then has grown into popularity not only in France but throughout Europe.

In the hands of our men of science, Coste, Pouchet, and others, the practice has attained the dignity of a science. They have defined, among other things, the regular relations

existing between the Sea and fresh water; in other words, the habits of certain salt water fish which visit our rivers at fixed seasons. The eel, wherever cradled, so soon as it has acquired the thickness of a pin, hastens to ascend the Seine; and in such numbers, in so great a flood, that the river is completely whitened by them. Such a treasure, if skilfully managed, would provide myriads of fish, each weighing several pounds, but it is now most shamefully wasted. The precious germs are sold at a low price in bucketfuls.

Nor is the salmon less punctual in its migrations. It invariably returns from the Sea to its native river. Fish have been purposely marked so as to identify them, and present themselves in due season almost without fail. Such is their love of their natal river, that though its course may be broken up by weirs, and even by cascades, they dash onward, and use incredible efforts to reascend it.

The Sea, which originated life upon this globe, would be also its beneficent nurse, if man only knew how to respect the order reigning in it, and abstained from interrupting that order.

He ought not to forget that it has an existence of its own, a second existence, with its independent functions, intended for the safety of the planet, contributing powerfully to secure the preservation of the latter, its harmoniousness, and its salubrity. All this it did for millions of ages, mayhap, before the birth of man. It dispensed wonderfully well with him and his wisdom. Its eldest born, between them, achieved the circulation of substance, the exchanges and the successions of life, which effect the rapid movement of constant purification in a perfect manner. How can man interfere with a movement continued so far from his ken in a profoundly obscure world? To little good, to much evil! The destruction of any particular species may seriously prejudice the general order, the universal harmony. Let him reap a moderate

harvest, at the fitting season, of those kinds which breed in superabundance; let him live upon individuals, but respect the species; in each let him be mindful of the part which all perform as agents and ministers of Nature.

We have already passed through two ages of barbarism.

In the first we said, with Homer, "The barren Sea," and traversed it only in quest of fabulous or foolishly exaggerated treasures in remote regions.

In the second, men perceived that the wealth of the Sea was contained in itself, and put out their hands to seize it, but with a blind and brutal violence.

To the hatred of Nature which the Middle Ages cherished is now added the eagerness of the mercantile and industrial spirit, which avails itself of terrible machines, killing from a distance—killing without danger to those who use them—killing their victims wholesale. Every step forward in art has been accompanied by a similar advance in the barbarous science of extermination.

Take, for an example, the harpoon hurled with a fulminating apparatus. Take, for an example, the destructive drag-net, first employed in 1700; a net which crawls along, immense and heavy—which gathers in even the future life of Ocean, and has swept clean its depths. Its use was prohibited in French waters, but the foreigner came and *dragged* beneath our very eyes! Some species have therefore abandoned the Channel, and moved towards the Gironde. Others have perished utterly. The same fate will overtake an excellent and magnificent fish, the mackerel, which is barbarously hunted up at all seasons of the year. The prodigious generative faculty of the cod cannot protect it. Even off Newfoundland its numbers are diminishing. Perhaps it flies for safety to unknown solitudes.

An understanding must be arrived at between educated

nations to substitute a state of civilization for this state of barbarism, so that man, growing more thoughtful, may no longer squander his blessings, nor do himself a permanent injury. England, France, and the United States must propose to other countries, and insist upon their promulgating, in general agreement, a *Law of the Sea*.

The old special regulations made for river-fishing are no longer adapted to modern navigation. An universal code, applicable to every sea, is now required; a code to regulate not only the relations of man to man, but those of man to the animals.

For so much he owes to himself and owes to them; no longer to convert the fisheries into a blind and barbarous hunt, where more are killed than he is able to capture, where the fisherman ruthlessly immolates the young which, in a year's time, would be abundantly fattened, and then, by the death of a single individual, would have rendered unnecessary the death of a crowd of others.

So much he owes to himself and owes to them; not to prodigalize without cause death and pain.

The Dutch and English are careful to kill the herring immediately it is taken. The French are more neglectful,—cast it into the boat, pile hundreds upon hundreds, and leave them to die of suffocation. Their protracted agony changes them, and deprives them of both flavour and firmness. Their anguish induces mortification; they fall into the same condition as cattle which die of disease. As for the cod, our fishermen kill them as soon as caught; those which get entangled in the net at night, and undergo long hours of effort and despairing agony, are worth nothing in comparison with the former. (See the excellent observations of M. Baude.)

On land, the hunting season is strictly regulated; and the same should be the case with the fishing season, paying particular regard to the spawning time of every species.

It should be arranged, as is the rule with respect to thriving plantations, to leave a sufficient interval for production and reparation.

The young and spawning females ought to be respected, and particularly in species which are not superabundant; particularly in the higher and less prolific families, the cetacea and the amphibia.

We are compelled to kill; our teeth and our stomach demonstrate that it is our misfortune to have need of death. We ought to make compensation by multiplying life.

On land we literally create and carefully protect our herds; we provide for the increase of numbers of creatures which would otherwise never be born, would be less fertile, or would perish in their youth, devoured by beasts of prey. We thus establish over them a quasi-right.

But in the waters a far greater amount of young lives are annihilated; while, by defending and propagating them, and by swelling their numbers, we should establish a claim to live upon the excess. Generation there may be readily let loose, like an element, and, in fact, augmented indefinitely. Man, in this world especially, appears as the great magician, the powerful promoter of love and fertility. He comes forward as the antagonist of death; for if he profits by it in his own person, the share which he allots to himself is as nothing when compared with the torrents of life he can create at will.

For the valuable species now on the brink of destruction—especially for the whale, the grandest animal, the richest life in all creation—half a century of absolute peace is indispensable. This would repair the disasters its race has sustained. When no longer hunted, it would return to its native climate, the Temperate Zone; would there resume its innocent mode of existence, pasturing on the living prairie, feeding on the minute elementary organisms. Restored to its ancient habits

and proper aliment, it would once more flourish, and regain its gigantic proportions; we should once more meet with whales two hundred and three hundred feet in length. Let its old accustomed love-haunts be respected. This would largely contribute to revive its fecundity. Formerly it preferred one of the Californian bays. Why not give it up to the whale? It would then cease to retire to the cruel icy solitudes of the Pole, the miserable retreats whither man madly pursues it in such wise as to render impossible the love by which he himself would profit.

Peace,—peace, then, we claim for the whale; peace for the dugong, the walrus, the lamantin—for those precious species which otherwise will soon have disappeared. A long period of rest is absolutely requisite for them, like that which has very prudently been decreed in Switzerland for the benefit of the wild goat; a beautiful animal, which the hunters had incessantly pursued and almost destroyed. It was even supposed to have really perished, but it has soon reappeared.

For all, amphibia and fishes, a season of repose is indispensable—a "Truce of God."

The most successful method of multiplying them is by sparing them at their season of reproduction, at the hour when Nature accomplishes in them her work of maternity.

It would seem that they themselves are aware that at such a moment they are sacred: they lose their timidity, they rise to the light, they draw near the shores; they have the air of believing themselves secure of some degree of protection.

It is the apogee of their beauty and their strength. Their dazzling liveries, as well as their phosphoric lustre, indicate the supreme radiance of life. We ought to respect religiously this moment in every species whose excessive fecundity does not render it alarming. Let them die afterwards—well and

good! If we must kill them—kill them! but, in the first place, suffer them to live!

Every innocent life has a right to its brief interval of happiness; to the moment when the individual, however low its rank in the scale of creation, passes beyond the narrow limit of its individual egotism, longs for something more than itself, and in its dim desire penetrates into the infinity where it ought to perpetuate its kind.

Let man co-operate with it! Let him come to the assistance of Nature! He will be blessed, from the abyss to the stars! His work will be favoured by the Most High, if he become a promoter of life and happiness, if he distribute to all the share which even the lowest have a right to enjoy in this world below.

BOOK IV.

THE SEA AS A REGENERATOR.

And by the waters all the summer long.

WORDSWORTH.

Oh! 'tis a feeling great, sublime, supreme,
Like the ecstatic influence of a dream,
To speed one's way thus o'er the sliding plain,
And make a kindred being with the main.

P. J. BAILEY, *Festus.*

BOOK IV.

THE SEA AS A REGENERATOR.

CHAPTER I.

THE ORIGIN OF SEA-BATHS.

THOUGH the Sea has been so evilly entreated by man in the pitiless war we have described, it has not displayed itself towards him the less generous or beneficent. When the rude Earth, which he loves so keenly, has worn him out and exhausted him, it is this dreaded, this accursed Sea, which welcomes him without rancour, folds him to its bosom, and restores him to life and vigour.

And, in truth, was it not from the Sea that the primitive life arose? It contains all the elements in marvellous abundance. Why, when our strength fails us, should we not refresh ourselves at the brimming fountain which invites us to quench our thirst?

Liberal and kindly is it towards us; but most beneficent, it seems, and most sympathetic, towards those creatures which are nearest to the natural life—to the innocent children suffering for the sins of their fathers; to the women, victims of society, whose errors are specially errors of love, and who,

though less culpable than we are, nevertheless bear far more of the burden of existence. The Sea, itself a woman, delights in invigorating them; gives strength to their weakness, dissipates their languor, adorns them, and renders them young and beautiful with its eternal freshness. Venus, who of old sprung from the Ocean, is born anew in its waters daily; not the enervated, tearful, melancholy Venus—but the true Venus Victrix, in all her triumphal potency of fertility and desire.

How could man effect an approximation between his extreme feebleness and this grand, wholesome, but wild and rugged force? What union could there exist between two parties in this respect so unequally endowed? The problem was an important one. An art and an initiation were necessary here; to comprehend which we must know the time and the occasion when that art began to be revealed.

Between two strong ages—the eras of the Renaissance and the Revolution—intervened a period of feebleness, in which certain grave indications of moral and physical enervation appeared. The old world which was dying out, and the new which was not yet born, left between them an *entr'acte* of a century or two. Conceived of vacuity, the generations which then arose were weak and sickly. They were decimated alike by excessive pleasures and excessive miseries. France, thrice revived from base to summit in a century, climaxed in an orgie of the sick, the Regency. England, though then growing great upon our ruins, did not seem less deeply affected. The Puritan idea had waned, and no other took its place. Degraded under Charles II., she was dragged at a later period through the miry slough of Walpole's administration. In the general degradation, all the lower instincts of human nature came to the surface. The noble book of "Robinson Crusoe" reveals the imminent apparition of Alcoholism. Another and a terrible book, in whose pages Physic summoned to its

assistance all the menaces of the Bible, denounced the gloomy suicide of egoistical depravity which avoided marriage.

Distorted thoughts, evil habits, a sluggish and unwholesome life,—all these were physically produced by the relaxation of the muscular tissues, the morbid decay of the flesh, and numerous scrofulous diseases. Charmingly rosy complexions concealed the gravest maladies. Anne of Austria, so renowned for her extreme fairness, died of an ulcer. That dazzling blonde beauty, the Princess de Soubise, perished, so to speak, inch by inch.

In England we find an inquisitive nobleman, the Duke of Newcastle, inquiring of Dr. Russell why the human race was wasting and degenerating, why its lilies and roses only covered scrofula?

It is very seldom that a race thus weakened takes firm root again, but the English did so. It regained, for seventy or eighty years,* an extraordinary force and extreme activity. It owed its renovation, at the outset, to its grand enterprises —nothing is so healthy as movement!—but also, we must own, to the change effected in its habits. It adopted a new regimen, a different principle of education, a fresh system of medicine: every man longed to grow strong, that he might do, and traffic, and make money.

No genius was necessary for this purpose. The great ideas of this renovation were already discovered, but it was needful now to apply them. The Moravian Comenius, anticipating Rousseau by a century, had exclaimed: "Return to Nature! Follow her in your schemes of education." The Saxon Hoffmann had said: "Return to Nature! Follow her in your systems of medicine."

* [Does M. Michelet mean that this new-born vigour has again died out? If such be his opinion, we may ask him to explain how Englishmen have accomplished, of late years, such great facts as the suppression of the Indian Mutiny, the foundation of a Volunteer Army, and the wonderfully brilliant Abyssinian Campaign. In the last half century we have doubled our Indian territory, and laid the basis of an empire in Australia.—*Translator.*]

Hoffmann appeared opportunely, about the epoch of the Regency, at the close of the orgie of pleasures and the orgie of quack medicaments, which aggravated each other's evils. He said: "Avoid your physicians; be sober, and drink water." It was a moral reformation. In the same manner we have seen Priessnitz (1830), after the Bacchic revels of the Restoration, impose on the proud aristocracy of Europe the rudest penance; feeding them on the peasant's coarse bread, keeping at mid-winter the most delicate ladies under cascades of icy water, in the midst of the fir-trees of the North—keeping them in a hell of cold, which by reaction made a hell of fire! So vehement is in man the love of life—so strong is his dread of death—his devotion to Nature, when he hopes from her a respite!

To come to the point—why should not man's safety lie in water? According to Berzelius, four-fifths of his body are water, and to-morrow he will be resolved into water. The same proportion exists in the majority of plants. And as salt water, it covers four-fifths of the globe. For the arid element (earth) it is a never-failing *hydrotherapeutic*, which heals it of its dryness. It quenches its thirst, nourishes it, swells its fruits and harvests. Strange and all-powerful fairy! With so little means, it does so much; with so little means, it destroys all things—even basalt, granite, and porphyry. It is the grand, but the most elastic force, which lends itself to the transitions of the universal metamorphoses. It envelopes, penetrates, resolves, and transforms the whole of Nature.

Is there any frightful desert, or gloomy forest, where man does not seek the waters springing from Earth's bosom? How superstitious is the reverence paid to these redoubtable fountains which bring us the hidden virtues and essences of the globe! I have met with fanatics who had no other god than Carlsbad; that miraculous meeting-place of waters of the most opposite character. I have seen devotees who wor-

shipped Baréges. And, for myself, my mind was seized with awe before the boiling mud where teems the sulphurous water of Acqui, labouring with such strange pulsations as you only see in animated beings.

The hot baths are life or death; their action is decisive. How many invalids owe to them a speedy termination of their sufferings, who would otherwise have lingered for years! Frequently these potent waters create in one a sudden revival, in a moment restore one to health, and recall with formidable energy the very passions in which the evil originated. These passions return violently, and in impetuous gusts, like the burning springs which have summoned them again to life. The reeking steam, and the sulphurous vapours, and the intoxicating air of the country, seem to have engendered the *aura*, or afflatus, which inspired the ancient Sibyl, and compelled her to pronounce the oracles of the god. In us they produce an outburst of the very things which we would most jealously have concealed. Nothing truly exists in these Babels where, under the pretence of seeking health, men live uncontrolled by the laws of this world, as if protected by the immunities of the other. The dead, the dying, bending with pale brows over the gaming-table, open that ghastly night of unbridled enjoyments which frequently knows no dawning!

Far different is the breath of the Sea. In itself it is a purification.

This purity springs also from the air. It proceeds, above all, from the rapid interchange taking place between both elements, from the mutual transformation of the two oceans. There is no repose; nowhere does life languish or fall asleep. The Sea makes, and unmakes, and remakes. Every moment it passes, wild and vivacious, through the crucible of death. The still more violent air, tossed and beaten to and fro by the gale, carried away in whirlwinds, concentrated that it may

burst out afresh in electrical cyclones, undergoes a constant revolution.

Life upon land is rest; life upon the Sea, a battle, an invigorating struggle for him who is able to endure it.

The Middle Ages cherished a dread and an abhorrence of the Sea, "the kingdom of the Prince of the air"—a title also given to the Devil. The aristocratic seventeenth century had no fancy for living among boorish seamen. The château, with its monotonous aspect, and its clumsy garden, was almost always situated as far as possible from the Sea, in some locality without air and without prospect, surrounded by humid woods. In the same manner, the English manorial mansion, lost in the shadow of great trees, and in a heavy mist, frequently mirrored its walls in the slime of an unhealthy morass. These striking features of the England of to-day — its numerous marine villas, its love of a sea-side residence, its baths even in the depths of winter—are entirely modern, premeditated, and necessary.

The peoples of the sea-coast, because nourished by the Sea, cherished a greater sympathy with it. Their instinct recognized in it a sublime potency of life. They were struck at first by its purgative virtue, and remarked that this purgation helped to neutralize the curse of the age, scrofula, and the wounds or sores resulting from it. They thought its bitterness a powerful remedy for the worms which torment children. They lived willingly on sea-weeds and certain polypes (*Halcyonidoe*), from a sense of the value of their iodine, and of its constrictive force in bracing up and purifying the tissues. These popular recipes were known to and collected by Dr. Russell; they put him in the right path, and greatly assisted him in his reply to the important question which the Duke of Newcastle propounded. That reply he gave in a curious and valuable work: *De tabe glandulari, seu de usu aquae marinae* (1750).

He has uttered in its pages a phrase of genius: "We act not to cure, but to remake and create."

He proposes a miracle, but no impossibility: to make flesh, and create tissue. Enough to say that he works by preference on the infant, who, though endangered by the sins of his ancestry, may still be reinvigorated.

It was the epoch when Bakewell invented meat. Thenceforth the cattle, from which man had drawn little but their milk, yielded a more generous nutriment. The sickly, milky diet had to be abandoned by those who were more and more rushing into a life of action.

Russell, for his part, opportunely invented the Sea, in his little book; or, more correctly speaking, made it the fashion.

His whole theory may be summed up in two words, but two words which are at once a system of medicine and education: 1st, We must drink sea-water, must bathe in it, and eat every marine product in which we find its properties concentrated; 2nd, We must clothe the infant very lightly, and keep it always well exposed to the fresh air.—*Air* and *water*, nothing more!

The latter advice was very bold. To keep an infant nearly naked, in a damp and variable climate, was to resign oneself beforehand to a sacrifice of the feeble. The strong survived, and the race, perpetuated by these alone, was the more successfully rehabilitated. Add that business, and enterprise, and navigation, removing the child from school, and emancipating him at an early age, it threw off the bonds of that sedentary discipline and crippled existence which England reserved alone for the sons of its peers, for the aristocratic pupils of Oxford and Cambridge.

In his ingenious book, illuminated only by the popular instinct, Russell was far from foreseeing that in a single century all the sciences would confirm his theory, and each revealing

some new aspect of the subject, a complete system of therapeutics would be discovered in the Sea.

The most precious elements of the terrestrial *animalism* abound profusely in the Ocean, entire and invariable, salubrious, vital—as a deposit for the renewal of life.

Therefore science has been able to say to all: "Come hither, ye nations; come, ye weary workers; come, ye young and exhausted women, ye children suffering from the vices of your fathers;—approach, O pale humanity, and tell me frankly, in presence of the Sea, what ye require to recruit your frames! This restorative principle, whatever it may be, is found in her."

The universal basis of life, the embryonic mucus, the living animal jelly wherein man was born and is reborn, from which he takes and retakes incessantly the pith and consistency of his being, the Sea possesses in such abundance that it is, in truth, the Sea itself. It makes of it, and wraps up in it, its plants and animals, and lavishes it upon them with unstinting hand. Its generosity puts to shame the economy of Earth. It gives; know ye, therefore, how to receive? Its nourishing riches are poured out upon you in torrents.

"But," say they, "our malady lies here, in the support and, as it were, the framework of the human body. Our bones are bent and twisted by our insufficient food, which does no more than deceive hunger; they are softened, and they totter." Well, the lime they are in need of abounds in Ocean to such an extent that it fills it with its shells and constructive madrepores, even to the creation of continents. Its fishes carry this material abroad in banks and vast shoals; so vast that when cast ashore the rich aliment serves for manure.

And you, pale, sickly, but youthful woman, who descendest towards the tomb without venturing to utter a word of lamentation, can we not see what aileth thee? Thou art melting away, vanishing out of thyself. But the tonic power, and the healthy

tonicity which renews all living tissue, is found in threefold abundance in the Sea. It is diffused over the surface in its iodized waters; it lurks in its wrack or varech, which is incessantly impregnated with it; it lies, all animalized, in its most prolific tribe, the *Gadidae*. The cod, and its millions of eggs, would of itself suffice to iodize all the Earth.

Art thou in want of vital heat? The Sea is rich in it, and in the most perfect; in that insensible heat which lies latent in all fat bodies, and which is of such potency that if it were not diffused abroad, balanced, and equilibrized, it would melt all the ice-fields, would convert the Pole into an Equator.

The rich red blood, the warm blood, is the triumph of the Sea. Through its agency it has animated and armed with unequalled strength its giants, which are so far superior to the entire terrestrial creation. It has made that element; for thy sake it may well remake it, to refresh and lift thee up again, thou poor, prostrate, and pallid blossom. The Sea is gorged, and overflows with it. In its children the blood itself is a sea, which, at the first stroke, rolls and strains, and empurples the distant Ocean.

See now the mystery revealed. All the principles which lie in thee are here united; this great impersonal person possesses, but possesses disunited. It has thy bones, it has thy blood, it has thy sap and vital heat—every element being represented by one or other of its children.

And it is gifted with what thou hast not, the superfluity and the excess of force. Its breath inspires in me a certain indefinable sentiment of gaiety, activity, creative power—what one might call a physical heroism. Notwithstanding its violence, the great generator does not the less pour out the rugged joyousness, the living and fertile alacrity, the flame of fierce wild love with which its own being throbs.

CHAPTER II.

ON THE CHOICE OF A SEA-SIDE RESORT.

EARTH is its own physician; every climate is a remedy. The medical science will more and more become a system of emigration.

Of far-seeing emigration. We shall act with a view to the future; we shall no longer remain inert, to brood over incurable diseases, but shall hasten to outstrip them by education, hygiène, and especially by travel; not a rash and headstrong and injurious travel, like that of the present day, but skilfully calculated to take advantage of the succour and powerful vivifying fountains which Nature has everywhere in reserve.

The youthfulness of the future will be found in these two things: *A science of emigration*, and *an art of acclimatization*. Man has hitherto been a captive, like the oyster on its rock. If he migrate ever so little out of his attempered zone, it is only to die. He will not be really a man and free until this special art shall have veritably made him the inhabitant of his planet.

Few maladies are cured in the places and under the conditions where they arose and which originated them. They belong to certain habits that these places perpetuate and render unconquerable. No reform, either moral or physical, is possible for him who obstinately clings to his original fault.

But medicine, enlightened by all the auxiliary sciences,

shall in due time furnish us with methods and directions for the prudent guidance of ourselves on this new path. The changes will, above all, require to be skilfully arranged. May we, without any preparation, or any modification of our ways of life and régime, be abruptly transferred from a completely inland climate (like that of Paris, Lyons, Dijon, Strasburg) to a maritime climate? May we, without first inhaling for some considerable period the air of the coast, begin sea-bathing? May we, without any prudent hydrotherapeutic precaution, commenced in our inland residence, venture upon braving the nervous construction, the *horripilation*, which lingers about us on emerging from the water—and this, too, in the open air, and under a strong wind? These preliminary questions will more and more attract the notice of physicians.

The extreme rapidity of modern railway travelling is completely "anti-medical." To go, as we do now, in twenty hours from Paris to the Mediterranean, traversing hourly such different climates, is a great imprudence for a nervous person. Do we not arrive at Marseilles in a pitiful condition of agitation and giddiness? When Madame de Sévigné occupied a month in travelling from Brittany to Provence, she accustomed herself by well-managed stages to the violent opposition in the character of those two climates. She passed insensibly from the maritime zone of the west into that of the east, into the purely terrestrial climate of Burgundy. Then, progressing slowly along the upper Rhone into Dauphiny, she confronted with less difficulty the strong breezes of Valence and Avignon. Finally, resting at Aix, in the interior of Provence, far from the Rhone and far from the coast, she became a Provençal in chest and respiration. Then, only then, did she approach the Sea.

France enjoys the peculiar advantage of the two Seas. Hence she possesses great facilities for alternating, according

to the seasons, the temperature, the stage of the disease, between the saline tonic of the Mediterranean, and the more moderate and gentler tonic (were it not for the tempests) which the Ocean offers us.

Upon each of its two Seas is situated a graduated scale of stations, more or less genial, more or less bracing. It is very interesting to study this double gamut, and more frequently to follow it, proceeding from the mild to the strong.

That of Ocean, which starts from the strong and strengthening, the windy and agitated waters of the Channel, softens extremely to the south of Brittany, is still further humanized in the Gironde, and attains a surprising softness in the sheltered basin of Arcachon.

That of the Mediterranean,—a circular scale (so to speak),—reaches its highest note in the dry keen climates of Provence and Genoa. Towards Pisa it softens; it attains an equilibrium in Sicily; and at Algiers a remarkable degree of fixity. Returning, it is exceedingly gentle at Valentia and Majorca, and the little sea-ports of Roussillon, which are so well defended from the North.

Two characteristics contribute before all things to the beauty of the Mediterranean: its harmonious framework, and the vivacity and transparency of the air and the light. It is a blue Sea, very bitter and very salt. It loses by evaporation thrice the quantity of water which it receives from its rivers. It would consist wholly of salt, and become as harsh and heavy as the Dead Sea, if its under-current, like that of Gibraltar, did not incessantly temper it with the waters of Ocean.

All that I have seen of its shores is beautiful, but somewhat rugged. There is no trace, however, of vulgarity. The signs of subterranean fire which one everywhere encounters—its sombre Plutonian rocks—never weary one, like the long line of the sandy dunes or the aqueous sediment of shattered

cliffs. If the famous orange-groves seem a little monotonous, by way of compensation you meet in sheltered recesses with an African vegetation, the aloe and the cactus, in fields of exquisite hedges where myrtle and jasmine predominate; and finally, you are enchanted with odoriferous heaths, breathing a wild perfume. Over your head, it is true, bald barren mountains very frequently pursue you to the horizon. Their long spurs, their huge roots, extending into the Sea, are clearly distinguishable at the bottom of the translucent waters. "It seemed to me," says a voyager, "that my barque floated between two atmospheres, that the air was both above and beneath." He describes the richly varied world of plants and animals, which he contemplated under this flood of crystal, in the neighbourhood of Sicily. Less fortunate I, in the Genoese Sea, though the water is equally transparent, could discover nothing but the desert. The dry volcanic rocks of the shore, with their black marble, or still more gloomy white, exhibited before my eyes, in the depths of the shining mirror, a succession of natural monuments, like ancient sarcophagi, or inverted churches. I sometimes fancied I beheld rude pictures of the cathedrals of Florence and Pisa. Sometimes also I dreamed I saw the silent sphinx, or monsters as yet unnamed—whales? elephants?—I knew not, but chimeras and fantastic visions; of real life I saw nothing.

Such as it is—this beautiful Sea, with its potent climatic influences—it admirably invigorates man. It gives him the driest and most enduring force; it creates the solidest races. Our Northern Hercules is stronger, perhaps, but certainly less robust, less easily acclimatized in all regions, than the Provençal or Catalan sailor, or the sons of Genoa, Calabria, and Greece. The latter, bronzed and copper-coloured, pass into a metallic state. Their rich complexion is no accident of the epidermis, but a thorough absorption of the sun and life. A wise physician, whom I count among my friends, always

sent his pallid patients of Paris and Lyons to enjoy there a series of sun-baths; while he would expose himself for whole hours on a rock. He protected only his head, and for the rest of his body endeavoured to gain a true African tint.

Those who are really invalids will go to Sicily, Algiers, Madeira, and the Canaries. But the regeneration of the weak, weary, and wan populations of our towns will possibly be more easily effected in the less even climates. It may well be looked for in those countries which have produced the surpassing energy of the globe—Greece, the steel of the human race—and the subtle, sharpened, indestructible breed of flint, of the Columbuses and the Dorias, the Massenas and the Garibaldis.

We may also look upon our sea-ports in the far North—Dunkirk, Boulogne, and Dieppe, situated at the meeting-point of the winds and currents of the Channel—as a factory of men, where they are made and remade. This mighty breath and this noble Sea, in their everlasting strife, might resuscitate the dead. And we meet there, in plain truth, with the most unexpected restorations. Whoever is not suffering from serious internal injuries, is rehabilitated in a moment. The entire human machine, willy nilly, works vigorously—it digests, and it respires. Nature there is imperative, and thoroughly understands how to make it go. The hard, healthy plants which flourish down to the very beach under the strongest sea-airs teach us to be ashamed of our languor. Each little Norman port is an opening in the cliff where the indefatigable north-west (the *Norouais*, in good Norman language) pants, and whistles, and reanimates everything. All this, be it understood, takes place less vehemently at the mouth of the Seine, among the orchards of Honfleur and Trouville. The gentle river, as it issues forth, inclines slightly to the left, and diffuses in that quarter its influences, of a mild and amiable character.

Further north we have seen the Sea in its impetuosity,

frequently in its fury, at Grandville, Saint-Malo, Cancale. These are the best schools to which you can send the young. There you may witness the Sea's defiance of man, and the struggle in which the strong grow stronger. The great naval gymnastic science ought to flourish in this region between Normans and Bretons.

If, on the other hand, we are concerned for some frail and decaying life—a weak and sickly child, or a beloved wife worn out with the travail of love—we should seek a milder asylum for our treasure. A shore which is quite tranquil and a Sea not so inclement we shall find, without going too far southward, among the little islands and drowsy peninsulas of Morbihan, which together constitute a more complicated labyrinth than that in which the king of old concealed his Rosamond. Trust your dear one to this prudent Sea. No one will know aught about it but the ancient Druidical stones which, in company with a few fishers, are the only tenants of these wild sheltered places. "But," says she, "what is there to live on?" "Above all things, madam, fish." "And what afterwards?" "Fish!" It is not far from Saint Gildas, the abbey where, according to the Bretons, Heloise came to rejoin her Abelard; and where they lived on a very meagre diet; on the sober and solitary regimen of Robinson Crusoe and his Friday.

By travelling southward you will come upon many more civilized localities, pleasing and attractive places, as Pornic, Royan, Saint Georges, and Arcachon.

I have elsewhere spoken of Saint Georges, of that mild shore and its bitter odours. Arcachon also rejoices fondly in its resinous pinadas, which possess so keen a scent of life. Were it not for the worldly invasion of the great and opulent Bordelaise—were it not for the mob which, on certain days, overflows and pours headlong into the town—this is, indeed,

the quarter where one would love to shelter one's precious invalids, those tender and delicate objects for whom one dreads the shock of the world. This town, so long as it was confined in its inland basin, offered the striking contrast of a profound and absolute calm at two paces from a terrible Sea. Outside the lighthouse raged the furious Gulf of Gascony. Within lay a sleepy tide and the languor of a silent wave, making no greater noise than the pressure of a little foot on the elastic cushion of soft sea-weed with which the too-yielding sand is strengthened.

Situated in an intermediate climate, which is neither north nor south, neither Brittany nor Vendée, I have seen, and with pleasure remembered, the charming and somewhat grave asylum of Pornic, its honest mariners and its pretty damsels, so picturesque with their peaked caps. It is an Eden of repose, which, protected in front by the long island, or rather peninsula, of Noirmoutiers, receives the Ocean only with an oblique, indirect, and subdued action. Scarcely has this Ocean entered into the bay before it grows *humanized*, and spins, with its wrinkled waves, fine threads of linen, as it seems, or of moire. In this basin of a few leagues in extent it has hollowed out numerous tiny narrow creeks or coves, with softly-sloping shores, for the behoof of women or as baths for children. These pretty sandy shores, which respectable rocks separate and conceal from the indiscreet eye, amuse you with their little mysteries. You may find here some examples of marine life, but they are fewer and poorer than of old. In so over-tranquil a basin the world of the waters receives no rich supply of aliment, and consequently is abandoning it. Less and less does our Sea attract the great wave of Ocean. It softens, it hushes its murmurs, which reach our ear greatly subdued. A singularly pleasing semi-silence prevails. Nowhere else have I so keenly enjoyed the full freedom of reverie, and the gracious charm of dying waves.

CHAPTER III.

WHERE TO DWELL.

MAY it be permitted to an ignorant individual, who has, however, acquired a certain amount of experience at his own cost, to offer some advice upon points invariably neglected in books, and to which our physicians until recently paid but little attention? That this advice may be the less vague, I shall address it to a sick lady who is in search of a suitable residence. Is she a fictitious character? Not at all. The person to whom I speak I have actually encountered, ay, and more than once in my life.

Here then is a young lady, ill, or on the point of being so, very much weakened, and with a child still weaker. With difficulty they have struggled through the winter and the spring. As yet no serious mischief has been done. The complaint is simply feebleness and anaemia—just the mere difficulty of living. We must send them to the sea-side to spend the summer.

For a moderate and narrow income this is a great expense; for the mistress of a household, a grievous inconvenience; for a tenderly attached couple, a painful separation. We negociate. We would fain mitigate the sentence of banishment. Will not a month suffice? No; the very wise physician insists on his original decree. He is of opinion that a short sojourn

often does more harm than good. The abrupt and violent effect of sea-baths, taken without any preparation, is well calculated to shatter the health even of the most robust. Every rational person will in the first place thoroughly acclimatize himself, and for this purpose the month of June is very suitable; July and August, for bathing: September, and sometimes even October, refresh us after the excessive heats of summer, subdue the excitability produced by the saline sharpness, consolidate the results attained, and help by their strong fresh winds to inure us against the cold blasts of winter.

Few men, however, are free during a whole summer. It is a great thing if the husband can rejoin his wife for a month, in August or September. However inclined he may be to sacrifice for himself all secondary interests, for his wife's sake he ought to remain. In the enthralled life of a working man there are chains which cannot be broken without much injury to his family. It is necessary, therefore, that she should go alone. And behold them now—divorced!

Alone? And she has never been so before. She would feel more reassured if she followed a family of wealthy friends, who were setting out complete—husband, wife, children, and servants. But if I dared give my advice, I should say, "Let her go alone."

This setting out in company, though at first very gay and agreeable, is often attended with very different consequences. We annoy one another, we quarrel, and so we return as enemies, or, what is much worse, as too warm friends. The idleness of the baths is often followed by unexpected results which we have cause to regret for the rest of our lives. The least inconvenience—and in my opinion it is no slight one—is that persons who, if separated, would have more thoroughly understood the Sea, and have returned with a wholesome and powerful impression, do but continue, if they live together,

the life of a great city, with all its frivolity, vulgarity, and false gaiety. Alone, we employ ourselves, and we think; together, we gossip, and talk scandal. These rich and worldly friends will drag the young lady into all their amusements. She will live a more excited, a more disturbed, and more anti-medical life than she did at Paris. She will completely miss the object of her journey. Reflect a little, madam; be courageous, and be prudent. It is in a thoughtful solitude, in the little innocent existence you will enjoy there with your child, —a life, it may be, infantine, but pure, and noble, and poetic, —it is only thus you will secure the wished-for restoration of your health. The tender, delicate justice which induces you to shrink from pleasure while another is at home toiling for you and your family, will tell to your advantage, believe me. The Sea will love you more fervently if you seek no other friend but it. In your sweet repose it will lavish upon you all its treasure of life and youthfulness. Your child will grow like a beautiful tree, and you will thrive in its favour. You will return young and adored.

She therefore submits, and sets out. The place she is to visit has been decided upon. It is well known, and the actual value of its waters has been determined by chemical analysis. But there is an infinite number of local peculiarities which cannot be divined at a distance, and are rarely known to our physician, who, in a great city, and ever busily occupied, has neither had the opportunity nor the leisure to study these localities.

To some of the more important, handbooks have been published, which are not without merit. In these you can read of the innumerable maladies which may be cured in each panegyrized resort. But few, very few specify the thing which we specially look for, the individuality of the place; they do not dare to tell honestly its strong side and its weak, or to

point out the exact position which it occupies in the scale of sea-side stations. They deal in general eulogiums, and so general as to convey very little information.

What is its actual exposure? If you look on the map, the coast faces southward. But this tells us nothing at all. It may well be that some peculiar curvature of the ground places your residence under a very cold influence; that, for instance, a torrent sweeping down beside you, or a hidden and perfidious valley, may bring you the wind of the north, or, through a bend of the hills, the west wind may engulf and drown you with its floods.

Are there any marshes in the neighbourhood? Nearly always we may answer, Yes. But the difference is great between marshes seasoned, renewed, and purified by the sea, and between stagnant pools of fresh water, which, after droughts, exhale contagious emanations.

Is the sea very pure, or mixed? And if the latter, in what proportion? A great mystery this, which we fear to open up. But for nervous persons, for novices beginning a series of salt-water baths, the mildest is the best. A somewhat mingled sea, an atmosphere not too salt or sharp, a not too barren shore, enriched with the attractions of rural scenery,—these are the most favourable conditions.

A point of primary importance is the choice of a residence. Who can guide you? No one. You must see and observe for yourself. You will obtain very little information from persons who have visited the locality, or even resided there. They praise or censure it, not so much in reference to its actual merits as to the enjoyments they have found, and the friends they have left there. They introduce you to these friends, and you receive a genial welcome. And at the end of a few days you begin to find out the inconveniences. You are residing in an uncomfortable house, or, it may be, in one absolutely unhealthy and dangerous. No matter, you are

tied to it. By leaving it you would wound the feelings of the person who recommended you to it, and the kindly and hospitable family who have so agreeably received you.

"Ah, well, then, I will keep myself free; and if on arriving there I meet with an honest and respected physician, I will beg of him to give me his advice." Honest! that is not enough; he must be intrepid, nay, heroic, to speak frankly on such a subject. He would embroil himself to the death with all the inhabitants. He would be a lost man. He would be banished to Coventry. He would have to live alone like a wolf; and would be fortunate if, one evening, he did not suffer some special injury.

I have a horror of those absurdly frail and light constructions which speculation builds for us in our variable climate. These pasteboard houses are the most dangerous traps. When the excessive heats of summer come on, we do not object to a bivouac, but often we remain at the sea-side until September, and even October, amidst strong winds and heavy rains.

Our landed proprietors, very wisely, for themselves erect good, substantial, and well-protected mansions. And for us poor invalids they rear houses of timber, ridiculous *châlets,* not well fitted with moss, *à la Suisse,* but thoroughly open, and with no single chink or cranny properly closed up. They laugh at us too palpably.

In these apparently luxurious but really miserable villas, nothing has been properly foreseen. There are saloons and state-apartments, with "a fine sea-view;" but the interior is wanting in conveniences, and possesses none of those delightful comforts a woman stands in need of. She has no quiet, secluded chamber. She lives in a kind of modified tempest, and is every moment exposed to abrupt changes of temperature.

On the other hand, the substantial dwelling of the fisherman, or even of the citizen, is frequently low, damp, and, through certain arrangements, incommodious. Very often it has no double, solid ceiling, but a simple partition of wood, through which ascends the cold air of the ground-floor; and this is a frequent cause of rheums and rheumatism, gastritis, and a score of maladies.

However you may decide, madam, between these two habitations, do you know what, above all things, I would wish you to secure? Laugh, if you like—it does not matter. Though we are in June, it is *a good chimney*, with a thorough draught. In our beautiful France, with its bleak north-wester, and its rainy south-wester, which, most years, prevails for eight or nine months out of twelve, we ought to be able to kindle a fire at any time. On a damp evening, when your child comes home shivering, and cannot get warm unless she retires to bed, you want at a moment's notice a bright, clear fire.

Two things in every house ought to be specially studied: the fire, and the water;—a tolerably good drinking-water is rare enough at the sea-side. If it is thoroughly bad, endeavour to supply its place with beer, or whatever may be the drink of the country.

Oh, that I could build for you with a word the villa of the future, which I have in my mind's eye! I do not speak of the sumptuous mansions or castles which the rich rear for themselves at the sea-side. I speak of the lowly dwelling suitable for moderate incomes. It is a new creative art, of which we seem to be distrustful. What we now attempt is copied from types utterly opposed to our climates, and unsuited to life at the coast. These kiosks, broken up with frail ornaments, are very well in sheltered localities, but here they make one tremble; one expects that every wind will carry them away. The châlets which in Switzerland project their immense overhanging roofs as a defence against the snow and a covering for

the hayricks, possess the serious inconvenience of blocking out the light; and in our northern Seas we ought to collect all the sunshine possible, not exclude it. As for imitations of chapels and Gothic churches, particularly inconvenient as residences, let us turn away from such ridiculous playthings.

The first problem, at the sea-side, is to secure a solidity, a firmness, and a thickness of walls which shall effectually prevent the tremblings and undulations we feel everywhere in the ordinary frail constructions; a reassuring fixity of foundation which will inspire a timid woman with a feeling of complete safety, and with that felicity of contrast which will draw from her the exclamation: "How good it is to be here!"

The second point is, that the side of the house facing inland shall be so perfectly sheltered that one may there forget the Sea, and, though by the side of its grand emotion, enjoy the most complete repose.

To meet these two desiderata, I should prefer the semicircular form, as affording less vantage-hold to the wind: that of a crescent, whose convex portion would afford me a varied panorama seaward, would ensure the rotation of the sun from window to window, and constantly absorb its light.

The concave of this semicircle, its interior, would be protected by the horns of the crescent in such a manner as to enfold the beautiful garden of the lady of the house. On issuing from the parlour, the gradual descent of the soil would enable us to lay out a garden of a certain area, protected from the sea-breezes, whose influence is often neutralized by an undulation of the ground.

"Flora flies from the Sea," we are told. What she really flies from is man's neglect. Here at Étretat, in the face of a very strong sea, on the highest point of the cliff, and exposed to the full force of the wind, I see a farm, with a vineyard and some noble trees. What precautions has their owner taken? A simple embankment of five feet high, on which

a completely fortuitous vegetation, a row of bushes, has been suffered to spring up; and behind this rampart a line of tolerably strong elms, which have sheltered all the rest. Certain localities in Brittany I might also address as examples. Who knows not the rich product of Roscoff in fruits and vegetables —so rich that she can supply them at a low price to Normandy itself!

To return to our house. I do not wish it to be lofty. Just a ground-floor, with a story above for the sleeping-apartments. No high attic, but a few low chambers to separate the first story from the roof.

Then, the house will be small. But, by way of compensation, it may be deep; it may have a double row of chambers: an apartment looking out seaward, and another facing inland.

The ground-floor, towards the land, ought to be somewhat sheltered by the upper story, which should project about four or five feet. This projection would afford, in the interior curve of the crescent, a kind of gallery for use in bad weather. The chambers below would be—the dining-room, a little closet perhaps for books (natural history and voyages), and another as a bath-room. I do not mean a real library or a luxurious *suite* of baths; but the essential, the simple, the convenient, and nothing more.

On stormy days, when the shore is no suitable promenade for weak chests, I should like to see the lady of the house, completely sheltered, seated in her garden, at work or reading. She should have there a gleam of life: some flowers, an aviary, and a little basin filled with sea-water, where she might daily store her discoveries, or the curiosities given her by the fishermen.

I should prefer the aviary to be one of those free and open aviaries which I have elsewhere recommended; where the birds might come at night to seek protection and a little food. It could be shut every evening to secure them from the

screech-owl, and opened every morning. They would return to it with strict punctuality. It is my belief that if it were sufficiently large, and planted with the trees which they are accustomed to frequent, they would breed in it willingly, under your protection, and intrust to your care their tiny fledglings.

How grave a life like this, and yet how full of charm! In this brief interlude of your existence, this short period of widowhood, what a gracious solitude! You find the situation a novel one. No more management, no more business. With your child you find yourself much more alone than you would be without him. But for this little companion, a guest would visit you in the shape of Reverie, with all its empty dreams. But your innocent guardian, your boy, does not permit its approach. He occupies you and makes you converse. He reminds you of home. With him at your side, you have ever present the sentiment that somebody is working for you far away, and counting every moment.

Flourish, O pure and amiable flower! Younger to-day than ever, you will once more find yourself a youthful maiden enjoying a delightful liberty, under the guardianship of your child.

CHAPTER IV.

THE FIRST BREATH OF THE SEA.

IT is a great and abrupt experience to abandon Paris at this fine season for the desert shore — Paris, now resplendent with its magnificent gardens and blossoming chestnut-trees.* June would be very delightful at the coast if we could go there in twain, before the invasion of the crowd. But when one visits it alone, the *tête-à-tête* with Ocean, and the sublime companionship of that grand anchorite, are not without a certain melancholy.

We do not derive a very favourable impression from our first excursions to the sea-shore. We feel it to be monotonous, savage, barren. The unwonted grandeur of the spectacle compels us to perceive, by contrast, our own littleness and weakness. The heart is driven back upon itself, and to a certain extent conjoined. The delicate lungs, which breathed but now in a small room, and suddenly find themselves in this chamber of the universe, exposed to the sunlight and the fresh wind, experience a feeling of oppression. The child goes and comes, runs and gambols. But she, seated and immovable, trembles at each chill breath. The warmth of the nest she has left returns to her thoughts. Meanwhile her child is happy, and this consoles her a little.

All this will change, madam. Take courage. Your im-

* [Written, as the reader will suppose, before the great siege of 1870.]

pression will be very different when, on a better acquaintance with the Sea, you will discover its populousness. That painful tightness of the chest will disappear through habit. You must inure yourself to the healthy, but salt and rugged air, which now does not refresh you. You must accustom yourself to it gradually, not with the express design of inhaling it. By degrees, thinking no more about it, and in sheltered corners, playing with your child, you will breathe freely and expand your lungs. But, for a beginning, remain only a short while upon the shore. Direct your walks towards the interior of the country.

The land, your old accustomed friend, invites your steps. Yonder pine-forests rival the Sea in wholesome emanations. Their resinous odours are not less strengthening, while they are far less bitter. They penetrate our whole being, enter through every pore, modify and purify the blood, and perfume us with a subtle aroma. On the landes behind the pine-trees, the simpler and somewhat coarse herbs, which you tread under foot, prodigalize upon you their fragrance,—a fragrance agreeably pungent; not dead and enervating, like that of the dangerous roses. Seat yourself among them, and, like them, well sheltered by this slight elevation of the ground. Might not one think himself here a hundred leagues from the Sea? Inhale them—these pure spirits—the souls of these wild flowers—your sisters through their purity. Gather them, if you please, madam. They ask no fairer fate. A little coarse, perhaps, and yet so sweet! In their virginal perfume lies a mysterious power to calm the soul and strengthen it. Fear not to hide them in your bosom, to lay them upon your heart.

Do not forget to remark that, at certain hours, these sheltered heaths are absolutely burning. They absorb and concentrate the rays of the sun. The feeble woman would wither in such a locality. The young girl, rich in life, would grow

inflamed, would suffer from feverish paroxysms. Her head would lose itself in astonishing and dangerous mirages. They should be visited on moist, mild, and close days; or better, rise early, when all nature is bathed in freshness, when the dew still sparkles scantily on the thyme, and the nimble rabbit still wanders and circles to and fro.

But let us return to the Ocean. When the tide retires, it reveals its true self, and offers you some specimens of the precious life nourished within its depths. You must follow it, step by step, over the damp sand, when the tide gives way a little. Be not afraid. At the utmost, the subdued wave will but kiss your feet. Look carefully, and you will see that the sand is not dead, but that in various places numerous stragglers are moving hither and thither, surprised by the ebb. On certain shores, tiny fish conceal themselves. At the mouth of a great estuary, the eels flutter beneath the sand, and create a tiny earthquake. The crab, in his eagerness for a banquet or a combat, has delayed rejoining the waters until too late. His line of retreat exhibits on the surface a strange mosaic, the zig-zag of its oblique march. Where this line terminates you find him squatted in patient expectancy of the next tide. The solen (or razor-fish) has plunged downwards; but you may know its retreat by the funnel which it reserves for respiratory purposes. The Venus is attached by a weed to its shell, which rises above the surface and indicates its hiding-place. The undulations of the soil betray to practised eyes the galleries of warrior-annelidae. Their arsenal would charm you; and so would the rainbow-gleam (seen through a microscope) of their changeful colours.

The most dramatic stroke takes place at the great tides. The Ocean, which then mounts very much higher than usual, at the reflux recoils to a greater distance. It then uncovers and gives up immense and unknown spaces. The mysterious bed of the Sea, of which we have dreamed so often, appears.

And then you surprise, in the secret life of their retreats, divers astonished populations, which thought themselves abundantly sheltered, and which have scarcely ever been exposed to the sun, much less to the eyes of man.

Recover yourselves, my terrified people. It is the curious but compassionate eye of a woman that gazes on you. This is not the fisherman's hand. "What wants she?" Nothing, but to see you, and salute you, and show you to her child and then leave you to your native element, wishing you good health and all prosperity

Sometimes it is not necessary to wander very far. You may find everything at a single point. Ocean amuses himself by making miniature oceans in the hollow rock,—oceans complete in themselves,—worlds a few feet square. Let us sit down and examine one. The longer we look, the more we see of tiny existences, at first unperceived, but gradually separating themselves into individuals. We should remain for an indefinite time, if the master, the imperious sovereign of the shore, did not drive us away from it with his incoming waves.

To-morrow you will return to the spot. It is the school, the museum, the inexhaustible amusement of both mother and child, where the penetrating subtlety of the woman, and her tender heart, seize and divine the meaning of every wonder. Maternity teaches her all: how life goes on creating and begetting itself. Would you know why her instinct so quickly reveals to her the secret of creation? why she enters so readily—like one who returns to her own home—into the mysteries of Nature? She is Nature herself.

At the bottom of the oily water, and its diminutive but rich and nourishing algae, lies a host of other liliputian plants, of graceful and subtle forms—a patient prairie—for the nourishment of the beasts (the molluscs) which browze thereupon. The patella and buccinus, violet-coloured mussels, rosy or lilac-

coloured *tellinae*,—all are tranquil creatures, and will wait. Better protected, the balanae, in their fortified town, close their fourfold shutters. To-morrow they will still be there. Do I say that in their intense inertia they never dream of movement? that they never cherish any confused idea and love of the unknown? of some benevolent being who will come at certain hours to refresh and feed them? Oh, they dream, and they await! Bereft of the great spouse Ocean, they know that he retraces his steps towards Earth to caress her. They keep their glance fixed upon his coming; and they who inhabit fixed abodes are on the watch with their door towards him to open at his advance. If he be a little impetuous, so much the better; they are only the more at ease, and rejoice in the living flood which cradles them so powerfully.

"See, my child, at our approach these immovable creatures have remained in their solitudes, while others, more lively, have taken flight. Let us watch those who have regained their courage. The frisking shrimp, with his delicate light papillae, *rainbows* the water, undertakes to create a wave and a tempest proportionate to such an ocean. The sea-spider, with slow and uncertain movements, releases himself by timid audacity: reascends to the light, to the genial surface. A prudent personage, couching deep among the sea-weed, under the violet corallines, the crab advances curiously, and after a furtive glance around, plunges once more into the forest.

"But what do I see? What is this? A great motionless shell suddenly springs into life, and undertakes to move forward. Oh, this is not natural! The fraud is too gross. The intruder betrays himself by his uncouth contortions. Who does not recognize you, my dainty masquer, Sir Bernard the Hermit? the deceiving crab which would pass himself off for an innocent mollusc! Your bad conscience troubles and agitates you too much."

On the marge of our Ocean, strangers to all these movements, the animated flowers expand their corollas. Near the unwieldy sea-anemone, a throng of charming little fairies, the annelidae, display themselves in the sun. On a tortuous tube rises a disc, an umbel, sometimes white, and sometimes lilac, or flesh-coloured. Bent a little awry, it has disengaged from itself an object which has no compeer in the vegetable world. Not one resembles its sister. All are inimitable in their delicate velvetiness.

Here is one, without umbel, waving all around a cloud of light fleecy filaments, just touched with a tint of silver-gray, from which five long tentacles escape, of a rich cherry colour. They undulate, they twist, they untwist, they entangle themselves in tresses of silver, creating under the water the most charming illusions. This may be nought for our coarser perceptions; but it is much for *her*, in whom the woman's nervous vitality and delicate sickly genius trembles at everything. She feels, she recognizes herself in these reddening and paling hues; she feels the flame of life which spreads, and glows, and dies away. Tender and affecting vision! She again bends her gaze on the delightful mimic ocean, and now can more clearly discover that prolific but too severe mother, Nature, who seems to taste a fearful joy in devouring her own offspring.

She will remain long wrapped in dreams, oppressed by this reflection. Woman would not be woman—that is, the charm of the world—if hers were not the touching gift of "tenderness for all life, compassion, and sublime tears."

She has not wept as yet, but has been on the very brink of tears! The child perceived it; and being already, as children are, attentive and of quick perception, he was silent. And without speaking they returned home.

This was the memorable day when, for the first time, her heart began to decipher Nature's language. And this lan-

guage had at once addressed her in words of so affecting a mystery that they had penetrated to her very soul.

The day declined. The laggard bird of the Sea pressed onward with oar-like wings to regain the Earth and her nest. As she and her child ascended the cliff, and passed into the twilight-dark garden, they heard the first shrill ominous cry of the bird of night.* But the aviary of refuge was safely closed, and the birds slept with head beneath the wing. Of this she made herself certain, and saw that all was secure. Her heart found relief in a sigh, and she embraced her son.

* [The screech-owl, probably, which has always been an object of popular superstition.]

CHAPTER V.

SEA-BATHS.—THE REGENERATION OF BEAUTY.

IF sea-baths, as some French physicians assert, have only a mechanical action, communicate to the blood no new principle, and are but a simple branch of hydrotherapia, it must be acknowledged that of all forms of hydrotherapia they are the harshest and most hazardous. From the moment that it is certain that this life-abounding water is of no more efficacy than fresh water, it becomes absurd to perform such experiments in the open air, exposed to all the chances of the wind, of the sun, and of a thousand accidents.

You who have observed, on her emergence from the water, a poor creature that has taken one of her first baths, and have seen how pale, ghastly, and terrified she looks, and how she trembles with a mortal shuddering, cannot but feel the harshness of such an effort, and its dangerousness for certain constitutions. Rest assured that no person would face a thing so painful if he could supply its place, in his own home, by a mild and prudent hydrotherapia.

Add that the impression, as if it were not sufficiently strong in itself, is aggravated for a nervous woman by the presence of the crowd. It is a cruel exhibition before a critical world—before rivals delighted to find her ugly for once; before superficial men, pitiless and silly mockers, who scrutinize, opera-

glass in hand, the awkward and imperfect toilette of a poor humiliated woman.

To endure all this, the patient must needs have faith, a strong faith, in the Sea—must needs believe that no other remedy would be of benefit—and be desirous at all costs of *imbibing* the virtues of its waters.

"Why not?" say the Germans. "If the very first moment of the bath *contracts* you, and closes your pores, the second—the reaction of warmth which immediately follows—reopens them, dilates the skin, and renders it keenly susceptible of *absorbing* the vital power of Ocean."

These two operations are nearly always accomplished in five or six minutes. If protracted longer, the bath frequently injures.

And, in addition, we ought not to subject ourselves to the violent emotion of the cold bath until prepared by the regular use of warm baths, which facilitate absorption. Our skin, which wholly consists of minute mouths, and in its own way absorbs and digests like the stomach, requires time to accustom itself to this strong nourishment, to drink the *mucus* of the sea—that salt milk which is its life, with which it makes and renews beings. Through a graduated succession of hot baths, warm baths, and nearly cold baths, the skin will acquire this habit, this necessity; it will grow athirst, and drink more and more largely.

For the rude ceremony of our first cold baths, we ought, at all events, to avoid the odious stare of the crowd. Let it be performed in some safe recess, without any other witness than your indispensable attendant, a devoted friend or servant, who helps you at need, watches and supports you, rubs you thoroughly, at the painful moment of your emergence, with very warm woollen cloths, and administers a light cordial of some warm drink, in which has been mixed a few drops of potent elixir.

"But," say they, "the danger is less when you are under the eyes of all. We are far distant now from the days of Virginia,* who, in her extreme peril, preferred to drown rather than take a bath." They are mistaken. We are more nervous than ever we were. And the impression to which I allude is, I understand, so strong and so revolting in many persons, that it may induce the most fatal results, such as aneurism and apoplexy.

I love the people, and I hate the crowd; and above all, the noisy crowd of fops and coquettes, who sadden the Sea with their gaiety, their fashions, and their absurdities. What! Is not the land large enough for you? Must you flock hither to make war on the poor invalid, to vulgarize the majesty of Ocean, and insult its wild true grandeur!

It was my grievous misfortune to spend a day from Havre to Honfleur on board a boat loaded, nay, overloaded with these imbeciles. Though the voyage was so brief, they had time to grow ennuyéed, and organized a dance. One of them (a dancing-master, perhaps) had his fiddle in his case, and played country dances in the presence of Ocean! It is true that I heard nothing, except now and then a small shrill note grinding across the solemn and awful bass which thundered around us.

I can easily imagine the melancholy of the lady who, in July, sees her beloved solitude disturbed by this invasion of idiots and eccentrics, of scandal and gossip. All liberty is at an end. The most distant abode is exposed all night to the echo of the tea-garden, the café, and the casino. By day, clouds of fashionable butterflies, in yellow gloves and polished boots, hover about the shore. A solitary lady is remarked. Solitary? Why? They ask one another. They approach, and make the child an excuse for bringing on a conversation; they

* [In Bernardin de St. Pierre's romance of "Paul and Virginia," the heroine perishes in the sight of her lover and her friends because, when her ship is wrecked, she refuses the assistance of a seaman, who would carry her ashore if she first undressed herself to increase the chance of safety.]

pick up shells for him. In brief, the lady, greatly embarrassed, and feeling herself insulted, remains at home, or only goes abroad in the morning. Thereupon a thousand ill-natured commentaries are uttered, some of which find their way to her ear, and cause her anxiety. For these importunate busy-bodies are sometimes influential people, who may be able to injure her husband.

Nowhere is one so imaginative as at the sea-side. The nights of July and August, hot and sleepless, are disturbed by all these annoyances. If she falls asleep in the morning, she does not benefit by it. The bath, far from refreshing her, adds the saline irritation to the heat of the dog-days. She has regained the restlessness and excitability of her youth, but not its energy. Still weak, and very nervous, she is the more seriously agitated by this internal storm.

Internal, but not concealed. The Sea, the pitiless Sea, brings out and reveals upon the skin all this inward excitement which she would fain have kept secret. She betrays it by patches of redness, and light efflorescence. All these minor miseries, from which children suffer still more severely, and which a mother loves to see upon them as signs of returning health, she regards as humiliations when inflicted on herself! She fears lest on their account she may lose something of her husband's affection! How little do women know of man! They forget that the greatest attraction, the sharpest stimulus of love, is not so much beauty as the storm.

"But if he found me ugly!" This is her speech every morning when she looks in her mirror. She dreads, while she longs for, the arrival of him whom she loves. She feels, nevertheless, utterly alone, and trembles, without knowing why, in the midst of the mob. She does not dare to go further away, and venture on a distant walk. Her agitation continues to increase. She grows feverish; she takes to her bed; twenty-four hours later and she sees him at her side.

Who has summoned him? Not she herself. But in its big, scrawling handwriting, a little hand has penned these words: "My dear papa, come quickly. Mamma is in bed. She said yesterday, 'If he were here!'"

He has come, and she is cured. And now see a truly happy man! Happy in seeing her recovered, in being necessary to her, in seeing her look so beautiful. She is embrowned, but so young! What life in her charming glances! What a soft radiance of health in the silkiness of her splendid tresses which wave all freely!

Is it a tale which we have just read? Is this speedy regeneration of life, beauty, and tenderness—this delightful adventure of recovering a young and passionate mistress in one's wife, rendered fully happy by one's return—is this miracle a fiction? Not at all. We very frequently witness the agreeable spectacle. If rare among the wealthy, it is by no means so in toiling families, who are the captives of their duties. Their forced separations are painful; the holidays which permit them after awhile to reunite, possess a charm which they do not conceal—they do not blush at being happy.

When we reflect upon the prodigious tension of modern life for working men (that is, for all the world, except a small number of idlers), we cannot but rejoice at the occurrence of such joyous scenes, when the re-united family open for a moment their tender hearts. Those who never share in them will say that it is *vulgar*, prosaic. The *form* matters little when the *meaning* is so touching. The anxious merchant who through a series of crises has still saved the barque which carries the fortunes of his family, the administrative victim, the employé worn out by the injustice and tyranny of his official superiors,—these weary captives have thrown off their fetters, and, in a repose all too brief, an amiable and loving family will teach them to forget their cares. In so noble a work

both mother and child are skilful. With their mirthfulness, and their caresses, and the diversions of the Sea, they seize upon the weary brain, and awaken it to more pleasant thoughts. It is their triumph; they lead him to and fro,—carry him to visit *their* shore, and to contemplate *their* Sea,—and enjoy his admiration. For all this belongs *to them*. They have taken possession of the Ocean in which they bathe, and please themselves by making him share it with them.

The wife becomes quite amiable and complacent towards the very crowd which had previously disquieted her. She feels herself so near him, and in such complete harmony with him! She is more than safe, she is brave; she grows familiar with the Sea and its billows. She declares she will swim; "she wishes to tame the Ocean"—a somewhat too bold ambition! At first she is utterly surpassed by her competitor, her child, who is now so active and daring. Thinking herself supported, she swims; but otherwise, she trembles, she sinks.—

She will make herself amends by frequent baths, for she has fallen in love with the Sea, and grown jealous of it. That Sea, in truth, does not excite any lukewarm passion. I know not what kind of electrical intoxication is in it, that one should so wish to absorb it utterly!

CHAPTER VI.

THE REGENERATION OF THE HEART, AND FRATERNITY.

THREE forms of Nature expand and elevate our soul, lift it above itself, and carry it into the infinite:—

The variable ocean of the Air; with its festival of light, its vapours and its *chiaro-oscuro,* its mobile phantasmagoria of capricious erections which so swiftly vanish.

The fixed ocean of the Earth; its undulation which we follow along the crest of lofty mountains, the upheavals which witness to its ancient mobility, the sublimity of the heights with their eternal snow.

Finally, the ocean of the Waters; less changeful than the first, and less permanent than the second, obedient in its regular alternation to the celestial movements.

These three forms compose the gamut, or musical scale, by whose means Infinity speaks to the soul. At the same time, observe the difference:—

The first shifts so constantly, that we can scarcely observe it: it deceives, it decoys, it amuses; it scatters and interrupts our thoughts. It is for the nonce the immense Hope, a day spent in the Infinite, in which we pierce even to the depth of Divinity. No, all has fled; the grieving heart is disturbed and doubtful. Why was I permitted a glimpse of this sublime dream of light? I can never more forget it, and the world remains obscure.

The fixed ocean of the mountains does not thus escape us. On the contrary, it arrests us at every step, and imposes upon us a severe but salutary gymnastic course. Contemplation can only be purchased by the most violent action. Yet the opacity of the earth, like the transparency of the air, frequently deceives and leads us astray. Who does not know that Raymond for ten years vainly sought Mont Perdu,* which we all see, but can none of us attain?

There exists a great, an important difference between the two elements: the Earth is dumb, the Ocean speaks. Ocean is a voice. It speaks to the distant stars, responds to their motions in its grave and solemn eloquence. It speaks to the earth and the shore with a pathetic accent, and holds a dialogue with their echoes; alternately plaintive and menacing, it roars or sighs. Before all, it addresses itself to Man. As it is the prolific crucible wherein creation began and wherein it is continued, in all its potency, it possesses a living language; it is life speaking to life. Its words are those myriads and myriads of organisms which issue from it. The milky Sea whence they emerge, the fertile marine jelly, even before it attains an organization, while it is yet white and foaming, speaks! And the whole, thus mingled, is the great voice of Ocean.

What says it? It speaks of *life*, and the eternal metamorphosis. It speaks of the fluid existence. It puts to shame the petrified ambitions of terrestrial movement.

What says it? *Immortality!* At the bottom of all nature lies an indomitable force of life. How much more so at the highest point of nature—the soul!

What says it? *Solidarity!* Let us accept the rapid exchange which takes place in the individual between his various elements. Let us accept the higher law which binds together the living members of one and the same body—humanity. And, beyond all, that supreme law, which makes

* Mont Perdu, in the Pyrenees, 10,994 feet above the sea-level.

us co-operators and creators in conjunction with the great Soul—associates, according to our degree, with the tenderer Harmony of the world—partners in the life of God.

The Sea, in those voices which we think confused, very plainly utters these weighty words. But man does not easily hear them when he descends to the shore deafened by the vulgar noises of society, weary, and overpressed, and degraded. Even in the best of us, the feeling of a loftier existence has sadly decreased. We are always on our guard against it. What, then, shall now influence the heart? Nature? Not yet. Softened by domestic sympathies—by the innocence of his children, by the tenderness of his wife—man first recovers his interest in the affairs of humanity. Hence one sees that souls have sexes, and are inspired by very different sentiments. Woman is most touched by the Sea and the poetry of the Infinite; but Man by the mariner and his perils, by the drama of his daily adventures, by the changeful destiny of his family. Though woman is tender towards individual suffering, she feels no very serious interest in classes. But every industrious toiling man who visits the coast, fixes his attention chiefly on the life of its labourers, its fishers and its sailors—that rough hazardous life of great danger and little profit.

I see him, while his wife rises and his child is being dressed, walking along the beach. On a bleak morning, and after a night of heavy rain, the boats return singly; everything is soaked and chill; the drops fall thickly from the boatmen's clothes. Their boys have also spent the night out at sea. And what do they bring back? No mighty treasure; but, nevertheless, they return alive. During the violent gale, their barques shipped heavy seas, and death seemed close at hand. A great opportunity this for the man who yesterday was bewailing his lot, to return to his proper self, exclaiming, "My condition is much happier than theirs!"

At eve, by the lurid light of an ominous sunset, while brazen clouds ascend upon a sinister Sea, he sees them again setting forth. "Shall we not have bad weather?" he inquires of them.—"Sir, we must live;" and they embark, with their children. Their wives, more than serious, follow them with their eyes, and many murmur in their hearts a prayer. Who will not join them in it? The stranger breathes his own ejaculations in their behalf, and says: "It will be a bad night. One would be glad to see them home again."

It is thus that the Sea opens the human heart, and overcomes the most obdurate. Whatever we may do, we find ourselves once more men. Ah, we are only too deeply affected by it! Every form of suffering is conspicuous among those brave, honest, and intelligent populations, incomparably the flower of our country! I have lived much at the sea-side. There every heroic virtue, which in inland districts we note as a precious rarity, pervades the common life. And yet, which is curious, you meet with no pride! All pride is reserved in France for the military career. Out of that, the greatest dangers count for nothing; it seems the simplest matter possible that men should brave them daily, and without a solitary boast. Never have I seen men more modest—I was about to say timid—than our pilots of the Gironde, who, from Royan and Saint Georges, go forth intrepidly and regularly to confront the great ocean-battle of Cordouan. At these towns, as at Granville—and, in truth, everywhere—only the women spoke, cried, regulated everything, settled all the business. Once ashore, these brave fellows uttered not a word, as peaceable as their valiant wives were noisy and proud, while exercising over their children all the paternal authority. The husband followed to the letter the phrase of the Latin poet, and thought himself "happy in being nobody in his own house."

Their ladies, deeply interested as they showed themselves in the stranger and in all the doings of the community, dis-

played not the less, I must admit, on great occasions, a truly royal, magnificent, and generous heart. At Saint Georges, they gave all their linen to make lint bandages for the wounded at Solferino. At Étretat, three English seamen had been wrecked at an inaccessible point of the shore; the whole population rushed to their assistance, despairing and grieving so long as they remained in danger; men and women exhibiting every sign of the most impassioned sensibility. When they were rescued, they received them with shouts and tears. They were housed, reclothed, overloaded with presents and kindly offices.

Oh, the good people of France! And yet, hitherto, how hard has been their lot, how sad! In the *régime* of *classes* (which, however, is of great utility, and gives us a mighty force) they are constrained every moment to quit the advantages of commerce for the naval service of the State, which is now very severe, and increases in rigour. Manoeuvres, forty years ago, were performed while the men sang. Now they are executed in silence. In the commercial marine the great fisheries have ceased. It is only the owners who derive any advantage from the bounties which Government pays on the whale. The cod has decreased in numbers; the mackerel grown feeble; the herring retires from our Seas. A very valuable little work* gives a most pathetic picture of the misery of our fishing population. Clever Alphonse Karr, writing from the dictation of a fisherman's wife, has had the admirable tact not to alter a single word.

Étretat is not properly a port. Lying very low, on a level with the Sea, it is only defended by a mountain of shingle, and of this barrier the tempest is the sole engineer, accumulating upon it additional supplies of pebbles. There is no other shelter. It is therefore necessary, according to the old rude Celtic custom, that every boat on coming in should be hauled

* "Histoire de Rose Duchemin," par Elle-Méme.

up on the quay, by means of a rope revolving upon a capstan. The capstan has four bars, and is laboriously turned round by the fisherman's wife, his daughters, and their friends; for the boys are at sea. You can understand the difficulty of the task. The unwieldy barque, as it mounts upwards, bumps from stone to stone, and from obstacle to obstacle, and crossing them in a succession of leaps. Each leap, each shock is felt in the breasts of these women; and it is no figure of speech to say that their laborious task is effected on their bruised flesh, their bosom, and their very heart.

The spectacle at first both grieved and wounded me. My first impulse was to hasten to their relief. Such a step would have seemed singular, and a certain false shame arrested me. Yet every day I *did* assist them—with, at least, my prayers. I was present, and I looked on. These young and attractive maidens (seldom pretty, but almost always attractive) did not wear the short red petticoat which formed the ancient costume of our coasts, but long dresses. Most of them were refined in race and mind, and many very delicate; they seemed akin to a higher class. But over their rude work (which, however, was refined by filial affection) they lacked neither grace nor stateliness; and their youthful hearts, in each painful effort, did not deign to yield to weakness the tribute of a complaint or a sigh.

This little quay of shingle—very little—is nevertheless too large. I saw there a number of useless and abandoned boats. The fishery has grown unproductive; the fish have fled. Étretat languishes and perishes, in the close neighbourhood of languishing Dieppe. It is more and more reduced to depend on the resources of its baths; on its bathing season, and the chances of its lodgings, which, sometimes let, and sometimes empty, profit one day and the next impoverish. This mixture with Paris—worldly Paris—however lavishly the latter may pay, is a scourge for the country.

Our Norman populations, which discovered America, which, as early as the fourteenth century, conquered the coast of Africa, are growing less and less partial to a seafaring life. A great number now turn their backs on the coast, and look towards the interior. The descendant of him who formerly launched the harpoon resigns himself to a woman's trade, and sinks into a pallid cotton-spinner at Montville or Bolbec.

It is the province of science and the duty of law to arrest this decay. The former, by its skilful guidance, if closely followed, will create the economy of the Sea and reconstitute the fisheries, the true school of the marine. The second, less exclusively influenced by terrestrial interest, will preserve in the marine service the flower of the country; its chosen *élite*, in no respect comparable with the great masses from whom we draw the soldier, but who will be the true soldier under certain circumstances which shall cut the knot of the world.

Such was my reverie on the small quay of Étretat in the gloomy summer of 1860, while the rain fell in torrents, the harsh capstan groaned, and the boat rose slowly.

She, too, drags onward—the ship of the present century—and with difficulty ascends. There is weariness, there is tardiness, now, as in 1730. It will be well that we assist her, and "put our shoulder to the wheel."* But many waste the time, sporting with shells and pebbles.

It is said that Scipio, the conqueror of Carthage, and Terence, an escaped captive from that shipwreck of a world, picked up shells on the shore, and grew good friends in their indifference to and abandonment of the past. They enjoyed therein the happiness of forgetting and blotting out life, of again becoming children. Ungrateful Rome, ruined Carthage—their two countries—weighed upon them but lightly; left scarcely a trace upon their soul, not more than the wrinkle of a wave.

* *Qu'on se mît à la barre*—Apply yourselves to the handspike.

Yet such will never be *our* desire; we have no wish to be children; no longing for forgetfulness, but, with persevering ardour, to assist in the painful movements of this great and weary age. We want the barque to reascend, and with stout hands we apply ourselves to the capstan of the future.

CHAPTER VII.

THE VITA NUOVA (OR NEW LIFE) OF NATIONS.

WHILE I am finishing this book, in December 1860, the resuscitated Italy, the glorious mother of all of us, sends me some beautiful love-gifts. A charming scrap of intelligence reaches me from Florence.

From that country great news have often come to us: in 1300, we heard of Dante; in 1500, of Amerigo Vespuccio; in 1600, of Galileo. What kind of tidings, then, do we get to-day from Florence?

Oh, apparently very insignificant! But who knows? They may prove immense in their results! They form a discourse of a few pages, a medical opuscule; in the title nothing attractive—in truth, it is more likely to repulse. And yet it contains a germ of incalculable consequence, which may change the face of the world.

On looking at the title I see the portraits of two children, one dead and the other dying, in the hospitals of Florence. The author is a physician who has so very deeply felt (a rare circumstance) the loss of his little invalids, his poor unknown children, that he has felt constrained to record their sufferings and his own regrets.

The elder, some seven or eight years old, of a fine and austere nobleness of nature, with the shadow, as it seems, of a grand imperfect destiny hanging over him, has a flower

upon his pillow. His mother was too poor to afford any other gift, but had brought a posy on paying her evening visit; he preserved it with so much care, and so much devotion, that one sweet blossom survived him.

The other and younger, with all the affecting gracefulness of four or five years of age, is visibly dying; his eyes are dim with their last dream. Though unable to speak, they loved to see and watch one another, and the compassionate physician had them placed face to face. He has brought them together in the illustration, as they were together in death.

It is a truly Italian idea. Elsewhere one would have been afraid of appearing weak and tender-hearted; one would have dreaded the shafts of ridicule. But not so in Italy. The doctor writes before his public just as if he were alone. He unfolds himself unreservedly with a feminine copiousness and sensibility which alternately excite the smile and the tear. We must confess, however, that the language *is* in this respect very powerful; it is the charming tongue of women and children, so tender and yet so brilliant, so beautiful in its very pain. It is like a shower of tears and blossoms.

Then he suddenly pauses to excuse himself. If he has spoken thus, it is not without cause. "These children would not have died if I could have sent them to the Sea." And the conclusion is, we must establish at the sea-side an hospital for children.*

Truly we have here a man of conspicuous ability. He has taken heart, and everything will follow. Men are touched and attentive, women in tears. They pray, and they beg, and they demand. We can refuse them nothing; and without waiting for the action of government, a private society immediately establishes *The Children's Baths* at Viareggio.

* [Such an institution has existed at Margate for some years; and the Hospital for Sick Children, in Great Ormond Street, London, has also its marine sanatorium.]

One knows well the beautiful course, the enchanting semicircle, which the Mediterranean describes after quitting the rugged shores of Genoa, after passing beyond the magnificent roadstead of Spezzia, and plunging under the Virgilian olive-trees of Tuscany. Midway from Leghorn, a coast conquered from the Sea presents to us the little solitary sea-port henceforth consecrated by this delightful charity.

Florence, with her hospitals founded before 1000, took the initiative of all Europe in charitable works. In 1287, when the divine Beatrice inspired the muse of Dante, her father founded the hospital of S. Maria Nuova. Luther, no great friend of Italy, does not the less admire, in the narrative of his travels, her hospitals, and the beautiful Italian ladies who, veiled, and without parade, resorted thither to minister unto the sick.

The new foundation will be a model for Europe. We owe such a work as this to the Children; for the infernal existence which we are leading—our life of murderous toil, and still more murderous excess—recoils upon *them.*

One cannot disguise from oneself the profound changes which are visibly operating on our Western races. Their causes are numerous. The most prominent is the immensity and the increasing rapidity of our labour. Mostly it is compulsory, and imposed upon us by our career. But even those who are under no such necessity hurry headlong with equal speed. I know not what kind of ardour in our temperament, our disposition, our soured blood, impels us to move onward ever with greater swiftness. All former centuries were slothful and barren contrasted with the present. And the results are immense. We pour from our brains a wonderful flood of sciences, arts, inventions, ideas, products, with which we deluge the globe, the present, and even the future. But at what a cost is all this achieved! At the cost of frightful expenditure of

vital strength and of cerebral force, which proportionately enervates the generation. Our works are prodigious, and our children miserable.

Observe that this mighty effort, this excessive production, is the achievement of a few. America contributes little, Asia nothing. And in Europe itself it is all the work of a few millions of men in the far West. The others laugh to see us wear ourselves out; and think they will replace us. Poor barbarians! Do you think, then, that any Russian or any American backwoodsman will be to-morrow an artist, an English mechanician, or an optician of Paris? We are what we are by the refinement and culture of centuries. We are the heirs of a prolonged tradition. What will become of it if we die? No one is ready to take our place.

If we ourselves are willing to accept this exterminating labour, this suicide of fecundity, for the interest of the human race, we cannot conscientiously wish to destroy our children, and to ruin them along with us. Yet this it is which happens. They come into the world prepared for this dismal fate; our arts are in their blood, but also our fatigue. With a precocity which is terrifying, they know, and they can, and they would do. Yet they accomplish nothing; for they perish.

Man in his infancy, like the plants and all other things in nature, has need of rest, air, and sweet liberty. Here he meets with exactly the opposite, in our merits as in our vices. Everything would seem to have combined to suffocate the children. Do we love them? Undoubtedly, yes. And yet we kill them; for a social state so disturbed and so violent as ours, is, whether we know it or not, an actual war against childhood.

There are special moments in its development, there are certain crises, when it hangs upon a thread. Life seems to hesitate, and to ask of itself, "Shall I last?" At such decisive epochs, our contests, and a sojourn in our towns and in the hum of crowds, is, for these trembling, tottering creatures

—Death. Or (worse still!) it is the beginning of a long career of disease. A miserable existence commences, which, sinking and rising again, and again sinking, will drag itself onward three-fourths of its time at the expense of the charity of the public.

All this we must terminate at once. We must learn to look forward. We must rescue the child from his fatal surroundings; remove him from man's society; hand him over to nature; and teach him to inhale life in the sea-breezes. And thus the sick child will be cured. The foundling then will grow in strength and stature. Invigorated and hardened, more than one will take to a maritime career; and instead of a debilitated artisan or the truant of an hospital, the State will gain a robust and vigorous sailor.

But, indeed, why the State? Florence has demonstrated to us that a royal heart is worth royalty. Woman *is* a royalty, a supreme power. It is her place to decree.

Were I a young and beautiful maiden, I know well what I would do. I would enjoy my luxury and my splendour, and I would say to my lover in one of those moments when love attests, and protests, and swears, and experiences a yearning to prove itself by gifts—I would say, "I take you at your word. But do not think I shall be gratified by the ordinary presents. I detest your coarse modern cashmeres woven in India from the designs of London. I set little value upon diamonds, which will soon be seen in every street. M. Berthelot, who reproduces nature in duplicates, and has created so many living miracles, is about, with still greater facility, to lavish diamonds upon us.

"I love the substantial. I want a good house at the seaside, tolerably sheltered and well open to the sun, and large enough to accommodate fifty children. We need no great store of furniture. Once established there, they will not die

of hunger. Not a lady visiting the sea-side but will joyfully assist them. If the Beatrices of Florence have founded such asylums, why should not those of France? Are we less beautiful?—and you men, are you less devoted?

"If the Sea has added to my charms, as you tell me from morn to night, you owe it a souvenir for its shores. And if you love me, I suppose you would feel happy in sharing this good work with me, in our creating together this little world of children, and establishing them by the side of the great foster-mother. Let her preserve a lasting pledge of tenderness and loving purity! Let her testify, by a living deed, that we were united, in the presence of the Infinite, by a holy thought!"

One woman beginning in this fashion, another would follow up the enterprise;—our common mother—France. No institution could be more useful; no sacrifices could be more wisely laid out. Not that very much is needed. It would suffice to transfer to the sea-side some of our present inland establishments, and this would be an alleviation, since not a few of them are supported at a great charge for an absolute loss. They may be defined as manufactories of invalids, who are constantly begging for fresh alms.

In all that touches the public health and the national life, the Romans disdained petty haggling. When one considers their munificence, their great works for the conveyance of wholesome water even into second-rate towns, their colossal aqueducts, their Ponts-du-Gard, their enormous public baths, where the multitude bathed gratuitously, or, at the utmost, for the small charge of a farthing, one recognizes the loftiness of their wisdom. They had also their swimming-baths of sea-water. What they thus accomplished for an indolent and unproductive population, shall we hesitate to achieve for the salvation of that creative race which effects the entire progress of the globe?

I do not now speak of children only, but of men and women. In the heart of every town you will find at the present time another and an overloaded town—the hospital—to which the failing operative returns and returns incessantly. Its cost is therefore enormous: to whom? to other workers, who, in the final analysis, bear every public charge. He dies in his youth, and leaves his family paupers on the public bounty. It would be far easier to prevent than to cure. It is not for the invalid that we can do much, but for the man on the point of sinking, who has reached the limit of his strength. Ten days' repose at the sea-side would set him on his feet again, and preserve a vigorous artisan. The journey, the plain lodging requisite for so short a summer sojourn, a public table maintained on an economical scale, would cost infinitely less than a protracted residence in an hospital. And the man would be saved, with his wife and children; a man whose loss is frequently irreparable; for, as I have said, such an one is the slow product of a long tradition of industry; he is in himself a work of art—of the human art, so little understood—in which humanity is ever exalting and perfecting itself, like a creative power.

Will it ever be my lot to see these chosen of the Earth, these multitudes of the inventive, creative, and manufacturing people, who sweat and wear themselves out for the benefit of the world, incessantly renewing their strength in the great Bath ordained by God? All mankind profits and flourishes by virtue of their colossal toil. It owes to them its enjoyments, and its elegances, and its knowledge. It prospers upon their gifts; it lives upon their pith and blood. If, then, we bestow upon them the renovation of nature,—the air—the sea—a day of rest,—it will be an act of justice; and a benefit, moreover, for the human race, to whom they are so necessary, and who, if they died to-morrow, would find for itself an asylum.

Have compassion upon yourselves, poor men of the West! Think seriously of lending this assistance; take into consideration the common safety. Earth supplies you with the means of life; she offers you her best gift, the Sea, for your restoration. In losing you she would lose herself, for you are her genius, her inventive soul. In your life she lives; and you dead, she herself would die.

APPENDIX.

NOTES BY THE AUTHOR.

INTRODUCTORY.

"THAT great animal the Earth, whose heart is a loadstone, has on its surface a doubtful organism, which is electrical and phosphorescent, more keenly sensible than itself, and infinitely more prolific.

"Is this creature, which men name the Sea, a parasite of the great animal? No. It has not a distinct and hostile personality. It fecundates and vivifies Earth with its vapours. It seems to be Earth itself in its most productive aspects, otherwise called its principal organ of fecundity."

These are German dreams. But do I mean that all in it is dreaming? More than one great intellect, without going quite so far, seems to admit both for Earth and Sea a kind of obscure personality. Ritter and Lyell have said: "Earth herself travails. Can she be powerless to organize? How suppose that the creative force which we detect in every being of the globe is denied to the globe itself?"

But how does the globe act? How, at the present day, is it enlarging itself? By means of the Sea and the Marine Life.

The solution of these lofty questions presupposes a profound study of physiology, which as yet has never been effected. Meanwhile, during the last twenty years, all research has gravitated in this direction:—

1. We have investigated the outward and irregular aspect of the movements of the Ocean, and traced out the *Law of Storms;*

2. We have dived into the movements peculiar to the Ocean, its *currents*, the play of its arteries and veins; the former of which hurl the salt water of the Equator to the Poles, while the latter bring it back *un*salted from the Poles to the Equator;

3. The third and deepest problem, whose exposition must be left to the

new chemistry, is that of the proper nature of the marine *mucus*, of that gelatinous viscous fluid which we find everywhere in sea-water, and which seems to be a living organism.

It is quite recently that Brooke's sounding-apparatus, and more especially the soundings made prior to laying down the Transatlantic Cable, have begun to reveal to us the ocean-bed.

Is it peopled in its very depths? This has been denied; but Professor Forbes and Sir James Ross found life everywhere.

Previous to these beautiful discoveries, which do not date above thirty years ago, we could not have undertaken a book upon the Sea. That of M. Hartwig was the first attempt.

For myself, I was far from entertaining any such idea, when, in 1845, while preparing my book, "The People," I began to study in Normandy our coast population. During the last fifteen years (1845–1860) this vast and difficult subject has been constantly expanding before me, and has pursued me from shore to shore.

NOTES TO BOOK I.—A SURVEY OF THE SEA.

My first book, A SURVEY OF THE SEAS, is, as the title indicates, simply a preliminary digression. All important subjects fall to be discussed in the succeeding books.

I except two, the *Tides* and *Lighthouses*. As to these, my principal guide has been M. Chazallon's important *Annuaire*, now extending to twenty volumes.* The first is dated 1839. If the world gave a civic crown to him who saves one human life, how many would M. Chazallon have received! Until he took up the subject, the errors prevalent with respect to the Tides were enormous. By immense labour he has rectified the observations for nearly five hundred ports, from the Adour to the Elbe. Respecting Lighthouses, his *Annuaire* affords the most exact details. By its side we may place the lucid and agreeable summary which M. de Quatrefages has furnished in his *Souvenirs* of the system of lighting invented by Fresnel and Arago. The admirable invention of diminishing lights (*phares à éclipses*) is due to Descroizilles and to Lemoine, both natives of Dieppe.

For the various names of the Sea (p. 19), see Ad. Pictet, in his *Origines Indo-Européennes*.—On the constitution of water, consult the *Introduction* to the *Annuaire des Eaux de France* (Deville); Aimé, *Annales de Chimie*, vols. ii., v., xii., xiii., xv.; Morren, *Ibid.*, i., and the *Annales* of the *Académie de Bruxelles*, xiv., &c.—On the saltness of the sea, Chapmann, cited by Tricaut,

* This was written in 1860.

Annuaire d'Hydrographie, xiii., 1857; and Thomassy, *Bulletin de la Société Géographique*, 4th June 1860.

CHAPTER II., page 19.—*St. Michel-en-grève.*—My knowledge of this part of our coast, and of the questions connected with it, is derived from M. Baude's admirable and instructive papers in the *Revue des Deux Mondes*, which are equally well stored with facts and ideas. I refer elsewhere to his excellent views upon the Fisheries.

CHAPTER III., page 35.—In speaking of Brittany, I ought to have acknowledged my obligations to Cambry's work, from which I originally received my first impressions. It should be consulted in the edition which Emile Souvestre has enriched (and, we may say, enlarged to twice its size) with his capital notes and notices, which has enabled us ever since to foreknow the *Last of the Bretons*. In numerous little romances, admirably truthful, Souvestre has furnished us with the finest pictures we possess of our western coast, especially of Finistère, and the districts adjoining the mouth of the Loire. I should have been delighted to quote from so agreeable a writer (and so deeply lamented a friend), had I not forbidden myself in this book any purely literary quotations.

CHAPTER IV., page 37.—M. Elie de Beaumont's remarkable expression occurs at the commencement of an article which is, in truth, a great work,—his article *Terrains* in M. Alcide d'Orbigny's *Dictionary*.

NOTES TO BOOK II.—THE GENESIS OF THE SEA.

CHAPTER I., page 85.—*Fecundity.*—On the Herring, consult the anonymous Dutch writer, translated by De Reste, vol. i.; Noël de la Morinière's valuable works, printed and unpublished; Valenciennes, *On Fishes*, &c.

CHAPTER II., page 93.—*Sea of Milk.*—See Bory de St. Vincent, *Dictionnaire Classique*, articles *Mer* and *Matière;* Zimmermann, *Le Monde avant l'Homme*—a beautiful and popular work, which is in everybody's hands.

At page 99 I follow M. Bronn's book, crowned by the Academy of Sciences.

On the harmless character of marine plants, see the *Botany* of Pouchet, a book of the first order.—For plants which develop into animals, Vaucher, *Confervae*, 1803; Decaisne and Thuret, *Annales des Sciences Naturelles*, 1845, vols. iii., xiv., and xvi.; and *Comptes de l'Académie*, 1853, vol. xxxvi.; and

Montague's articles in D'Orbigny's *Dictionary*.—On the Volcanoes, refer to Humboldt's *Kosmos*, part iv.; and Carl Ritter, translated by Elisée Reclus, in the *Revue Germanique*, November 30, 1859.

CHAPTER III., page 101.—*The Atom.*—I have cited in my text the leading authorities: Ehrenberg, Dujardin, Pouchet (in his *Hétérogénie*). The theory of Spontaneous Generation will eventually triumph.

CHAPTERS IV., V., and VI.—In ascending throughout these pages to the higher life, I have taken as my guiding clue the hypothesis of Metamorphosis, without seriously wishing to construct a *chain of organic beings*. The idea of an ascending metamorphosis is natural to the mind, and, in a certain degree, is imposed upon us by fate. Cuvier himself confesses (towards the end of the Introduction to his book on "The Fishes") that if this theory has no historic value, it has at least a logical basis.—On the Sponge, see Paul Gervais, in Orbigny's *Dictionary*, v. 375; and Grant, in Chenu's *Natural History*, p. 307, &c.—On the Polypes, Corals, and Madrepores (chaps. iv. and v.), besides Forster, Péron, and Charles Darwin, consult Quoy and Gaimard; Lamouroux, *Polypes Flexibles;* Milne-Edwards, *Polypes et Ascidies de la Manche*, &c. See, too, with respect to the limestone, Sir Charles Lyell's two treatises, *The Elements*, and *The Principles of Geology*.

CHAPTER VI., page 129.—*Medusadae and Physaliae*—See Ehrenberg, Lesson, and Dujardin. Professor Forbes demonstrates from vegetable analogies that these animal metamorphoses are a very simple phenomenon (*Annals of the Society of Natural History*, 1844). Read also his excellent dissertations on *Medusae*, in 4to, 1848.

CHAPTER VII., page 137.—*The Echinus.*—Consult specially the curious dissertations in which M. Caillaud has embodied his discovery.

CHAPTER VIII., page 144.—*Shells, Mother-of-Pearl, Pearls* (*Molluscs*).—The great authority on this subject is Blainville's *Malacologie*. On the Pearl, Moebius of Hamburg, *Revue Germanique*, July 31, 1858. On this subject I have also consulted with advantage our celebrated jeweller, M. Froment Meurice.—I have spoken of the pearl as the peculiar ornament of women, because the art of making natural pearls has been discovered. I do not doubt that every woman will soon wear them.

CHAPTER IX., page 154.—*The Poulpe.*—See Cuvier, Blainville, Dujardin,

Annales des Sciences Naturelles, 1st series, vol. v., p. 214; and 2nd series, vols. iii., xvi., and xvii; Robin and Second, Locomotion of Cephalopoda, *Revue de Zoologie*, 1849, p. 333.

CHAPTER X., page 160.—*The Crustacea.*—Besides the valuable and classical work of Milne-Edwards, I have consulted D'Orbigny and other voyagers. See Dumont d'Urville's beautiful *Atlas.*

CHAPTER XI., page 170.—Cuvier's Introduction; Valenciennes, article *Poisson* (D'Orbigny's *Dictionary*)—a complete treatise, scientific and excellent. On their anatomy consult Geoffroy's celebrated Dissertation. My observations on the spawn of fish, I owe to Messrs. Coste and Gerbe.

CHAPTERS XII. and XIII., pages 179 to 197.—*Whales, Amphibia, Sirenidae.*—On these subjects Lacépède is both eloquent and instructive. Nor can the reader wish for a better guide than Boitard, in D'Orbigny's *Dictionary.*

NOTES TO BOOK III.—THE CONQUEST OF THE SEA.

This book has naturally sprung from the perusal of the narratives of the navigators, from the primitive history of Dieppe (Vitet and Estancelin), down to recent discoveries. See, especially, the voyages of Kerguelen, Sir John Ross, Sir James Parry, Captain Weddell, Dumont d'Urville, Sir James Ross, and Dr. Elisha Kane; Biot, *Journal des Savants;* and the luminous and judicious abridgment of these records by M. Laugel, in the *Revue des Deux Mondes.*—On the Fisheries, in addition to Duhamel's great work, consult Tiphaigne's *Histoire Economique des Mers Occidentales de France* (1760).

CHAPTER III, page 219.—*The Law of Storms.*—Add to the books cited in the text the excellent résumé by M. Felix Julien (*Courants*, &c.), and the curious system of M. Adhémar, on a displacement of the seas occurring every two thousand years.

NOTES ON BOOK IV.—THE SEA AS A REGENERATOR.

As early as 1725, Marsigli seems to have suspected the existence of iodine. In 1730, an anonymous work, *Comes Domesticus*, recommended sea-bathing.

The bibliography of the Sea would be infinite. In every library I have found assistance. I have much pleasure in naming, among other excellent works, the Handbooks and Guides of Messrs. Gaudet, Roccas, Cochet, and Ernst. I have found some very rare books (as that of Russell's) at the École de Médecine, and many special treatises by foreign writers at the Dépôt de la Marine (as, for instance, Rear-Admiral Smyth's *Mediterranean*, 1854). I cannot sufficiently express my obligations to its director, as well as to its librarian, who has often called my attention to little known works.

On the degeneration of the human races, see Morel (1857); Magnus Huss, *Alcoholismus* (1852); and others.

I owe my knowledge of Doctor Barrellay's pamphlet, *Ospizi Marini*, to my illustrious friend Montanelli, and to M. Dall' Ongaro's charming articles.

My learned friend, Doctor Lartet, of Lyons, on receiving the first edition of the present work, wrote to me:—

For emaciated children I have obtained good results by a protracted exposure to the light—vivid and stimulating light. A mediterranean shore is requisite, where the child should live quite naked, having only his head covered with a hood, that he may roll in the sea and the hot sands. Near at hand should be a shed, or a kind of greenhouse, which, with windows to be kept close on cold days, ought not the less to be open to the sun."

POSTSCRIPT.—MARINE HOSPITALS FOR CHILDREN.

I learn with great satisfaction that the Parisian Board of the Society of *Assistance Publique* is now founding an establishment of this kind. May I be permitted to express my wishes?—

The first is, That they will not collect all the children into one place; that they will not make a Versailles, a sumptuous palace, but numerous small establishments in different localities, where the young invalids may be distributed according to their different maladies and temperaments.

My second wish is, That this foundation, in order to be permanent, may not prove a burden but a profit to the State; that the foundlings who may be placed therein, robust (*valides*) convalescents, and rehabilitated invalids, may be employed in the less fatiguing works connected with navigation and the harbours, and in the trades connected with these, so that they may acquire a partiality for, and the habits of, a maritime career. Now that our unfortunately too-numerous populations of fishermen and seamen turn their backs on the Sea, and adopt industrial occupations, we must supply this desertion. We

must create a new race, who have never heard discussed in the paternal hut the profits of the safe and prudent life of the interior.

The benevolence of France must thus create a maritime people, who, vowed beforehand to their heroic profession, shall prefer it to every other; who, cradled from their earliest years in the arms of Ocean, shall love only that sublime foster-mother, and not distinguish her even from the Mother-land!

TRANSLATOR'S NOTES.

[*On the Depth of the Sea.*—The maximum depth of the Ocean, as ascertained by the plummet, appears to obtain in the North Atlantic Ocean, to the south of the great Newfoundland Bank. It amounts, according to Maury, to 25,000 feet. The depth of Ocean varies, just as the height of our mountains varies, and from the same causes. In the Baltic Sea it seldom exceeds 1600 feet; in the Mediterranean, 5700 feet. In the Gulf of Mexico it probably never exceeds 7000 feet. In Baffin's Bay, Dr. Kane found 11,600 feet. Of the Pacific Ocean few data have as yet been collected, but the greatest depth ascertained by Lieutenant Brooke was 16,200 feet.]

[*Description of Brooke's Sounding-Apparatus.*—In this apparatus the sounding-line is fastened to a heavy iron rod, whose lower extremity is provided with a hollow cup to receive tallow or some similar substance. The rod passes through a hole in a 32-lb. shot, which is supported in its position by slings that hook on by means of swivels to the sounding-line. On the rod striking the bottom, it is obvious that the line will lose its tension, and the swivels being reversed, the slings fall out of the hooks, the ball drops to the ground, and the rod, relieved from its weight, is readily drawn up, with specimens of the bottom adhering to the greasy substance in its cup.—This apparatus was invented by Mr. Brooke, when a midshipman in the United States Navy.]

[*Estimated Extent of the Ocean.*—The area of the earth's surface occupied by the waters is estimated at about 23,814,121 square miles; being, when compared with the land (which is computed at 7,811,504 square miles), in the ratio of 3.8 to 1.2. Its mean depth being placed at 9000 feet, we may suppose the Ocean to represent a cubic mass of 3,279,000,000 yards.]

[*Some Remarks on the Tides.*—The theory of the tides may be briefly

stated thus:—The principal influence exercised is that of the moon, which upon any point of the earth's surface is in the inverse ratio of the square of its distance.

If we draw a straight line from the moon right through the centre of the earth, it will strike the surface of the waters at two points, diametrically opposite to each other; representing the zenith of the moon and its nadir.

The zenith of the moon will necessarily be the ocean-point nearest to that planet, and therefore the most strongly affected by it. Hence, it is here that the waters will swell or accumulate, and attain, as it were, their climax; while the waters at the antipodes, being less strongly attracted towards the moon, and more sensibly towards the earth's centre, will produce an inferior aggregation or swelling,—thus forming a double tide—a tide at the point nearest the moon, and a tide at the antipodes.

At the intermediate points on the surface of the globe, it will be low-water.

Owing to the rotatory movement of the earth, every part of its surface is exposed, in the course of twenty-four hours, to the lunar attraction. Therefore, at intervals of six hours, each point is either *under* the moon, or at a distance of 90° from it; and, consequently, in the lunar day—or in the time occupied between the moon's passage from, and return to, any particular meridian—the ocean-waters will reach their maximum and minimum twice on every point of the globe's surface. This result, however, is not immediate; the moon having always passed from the meridian before that meridian is reached by the mountain of waters which it draws in its rear—just as a steam-engine, on a railway, will shoot beyond any particular point in advance of the train which is moved by its attraction. The tide is about three hours behind the moon.

The sun also exercises a certain inferior influence on the sea; but—in consequence of its great distance—while that of the moon is represented by 1, that of the sun is only represented by $\frac{1}{3800}$. When the sun and moon are in *conjunction*, or *opposition*—that is, on the same meridian—they combine their power over the tidal waters, and produce a *spring*-tide; a result which occurs at the period of the *syzygies*, or new and full moon. When the solar action is opposed to that of the moon—namely, at the period of the quadrature, or first and last quarters—the tide is sensibly weaker.

The highest tides occur at the *equinoxes*, when the moon is in perigee; and lowest at the *solstices*, when it is in apogee.

As the lunar day exceeds our natural day by fifty minutes, the tide is fifty minutes later every day. The height of the tide is affected by local circumstances, and often varies greatly within a few miles.]

[*Course of the Gulf Stream.*—The Gulf Stream is a portion of the great Equatorial current, which a little to the south of the Equator divides into two branches. The southern strikes along the coast of Brazil, and afterwards reascends the west coast of Africa. The northern enters the West Indian waters, and by the Yucatan Channel passes into the Gulf of Mexico, where it assumes the name of the Gulf Stream. Maury describes it as "a river in the bosom of the Ocean; in the severest droughts it never fails, and in the mightiest floods it never overflows; its banks and its bottom are of cold water, while its current is of warm; it takes its rise in the Gulf of Mexico, and empties itself into the Arctic Seas. In no other part of the world is there such a majestic flow of water; its current is more rapid than the Amazon, more impetuous than the Mississippi, and its volume is more than a thousand times greater. Its waters, as far as the Carolina coast, are of indigo blue; they are so distinctly indicated that their line of junction can be marked by the eye."

On issuing from the Florida Channel it has a breadth of thirty-four miles, and a depth of 2200 feet. It moves with a speed of four to five miles an hour; and in the neighbourhood of Newfoundland divides into two branches, one of which visits Ireland and Great Britain, and even extends its genial influence to the Arctic Ocean. The other arm strikes southward, visits the coasts of Africa, and thence returns to the West Indies.]

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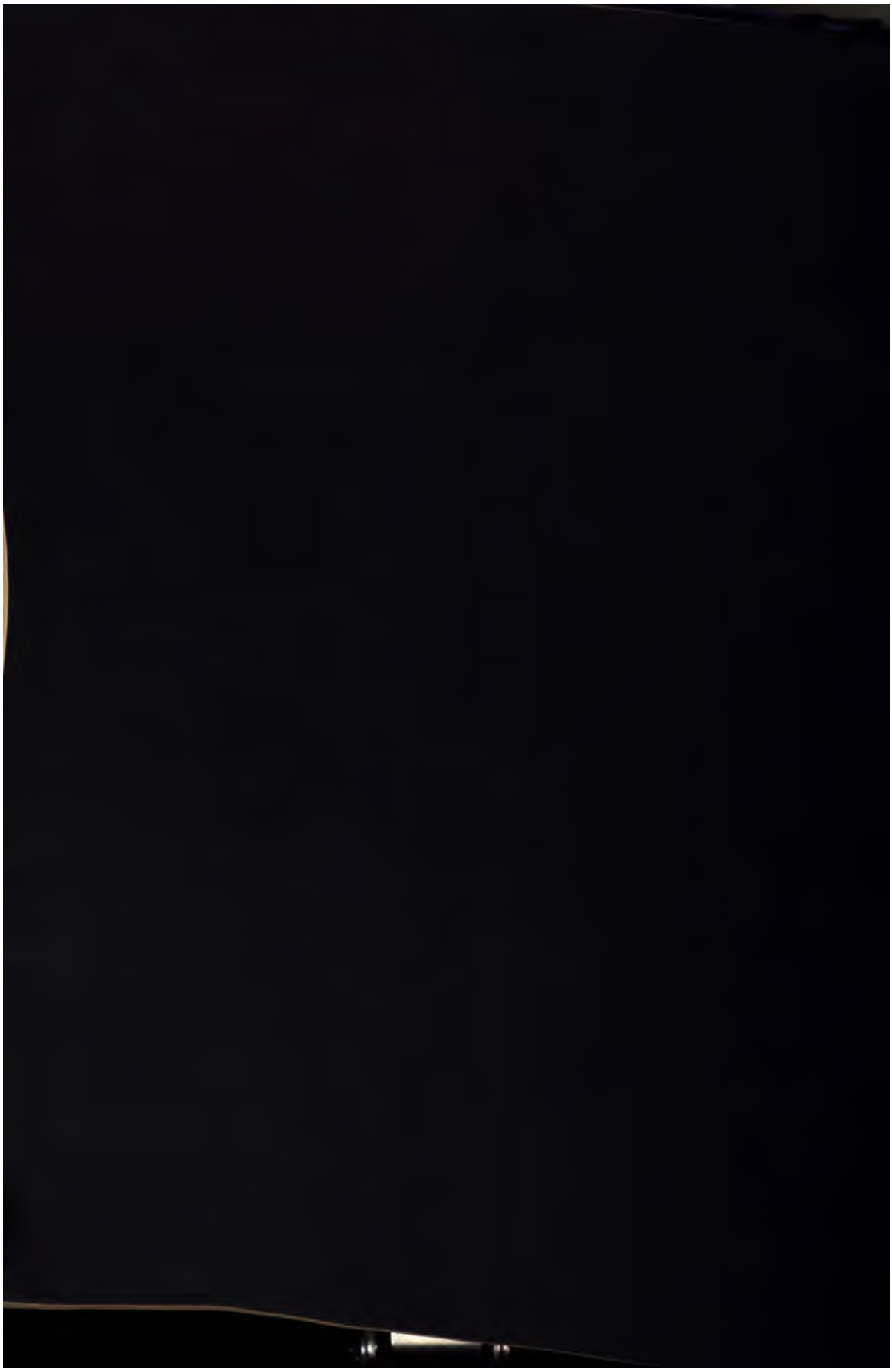
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